

PERFLUOROALKYL SUBSTANCES (PFASs) IN MANYBAR
GOATFISH AROUND O‘AHU

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A Thesis submitted in partial satisfaction of the requirements
for the degree Master of Science

in

Marine Science

College of Natural and Computational Sciences

Hawai‘i Pacific University

2021

Honolulu, Hawaii

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The views presented here are those of the author and are not to be construed as official or reflecting the views of Hawai‘i Pacific University

ABSTRACT

Perfluoroalkyl substances (PFASs) are known environmental pollutants found world wide. This study examined the PFASs concentrations in goatfish, *Parupeneus multifasciatus*, a common inshore reef fish caught in recreational and subsistence fisheries around O‘ahu, Hawaii. Forty-two fish were collected from 14 sites around O‘ahu, split into five groups: reference, landfill, sewage, ruban, and military/airport. Fish fillets were examined for 33 compounds by liquid chromatography tandem mass spectrometry. Three PFASs, perfluorooctane sulfonic acid (PFOS), perfluoroundecanoic acid (PFUnA), and 6:2 fluorotelomer sulfonate (6:2 FTS) were detected in some goatfish. Statistically only PFOS had significantly different concentrations among sites, with Ahuimanu and Pearl Harbor having greater concentrations than other sites ($p=<0.05$). PFOS was detected in all three fish from both Ahuimanu and Pearl Harbor, indicating potential point sources near these sites. 6:2 FTS concentrations were significantly greater at the military/airport site groups than the reference site groups ($p=0.03$). 6:2 FTS tended to be greater at military/airport sites than other urban areas ($p=0.08$). The average human daily intake from consuming goatfish was determined to be 0.113 ng/kg/day of PFOS, which is 30 times lower than fish consumption advisories. The goatfish PFOS concentrations (0.16 ng/g) were six orders of magnitude lower than previously reported no observable adverse effect levels (NOAEL) for fish, so no toxicity risk is currently predicted for this population of fish.



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by

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May 7th 2021

This thesis is submitted in partial fulfillment of the requirements for the degree of Master of Science in Marine Science at Hawai'i Pacific University. We the undersigned have examined this document and have found that it is complete and satisfactory in all respects, and all revisions required by the final examining committee have been made.

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Acknowledgments

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Guidance and Involvement

- Center for Marine Debris Research for laboratory space and support
- Katherine Shaw

Support and Advice

- Samantha Decker
- John Mingle
- Alicia Lader
- Beth and Dee Sawickij

This study was funded by the Hawaii Department of Health via the US Environmental Protection Agency's State Response Program Grant <https://www.epa.gov/brownfields/state-and-tribal-response-program-grants>.

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Chapter 1: Introduction to Perfluoroalkyl Compounds (PFASs) and PFASs contamination

Section 1: PFASs

Section 1.1 PFAS Chemical Structure

A PFAS is a chain of carbons bonded to fluorine atoms with a functional group attached ($C_nF_{2n+1}---R$) (Buck et al. 2011, Wang et al. 2017). PFAS is a general term used to describe both perfluoroalkyl and polyfluoroalkyl substances, more broadly described as fluorinated polymers, which are a large complex family of compounds with varying physical and chemical properties (Buck et al. 2011). Perfluoroalkyl acids (PFAAs) include perfluoroalkyl carboxylic ($C_nF_{2n+1}COOH$), sulfonic, sulfinic, phosphonic, and phosphinic acids (Buck et al. 2011). Wang et al. (2017) categorized PFASs into several subcategories: Perfluorinated carboxylic acid (PFCAs), perfluorooctanesulfonic acid (PFSAs), perfluoroalkyl phosphonic acids (PFPAs), perfluoroalkyl phosphinic acids (PFPiAs), perfluoroether carboxylic acids (PFECAAs), perfluoroether sulfonic acids (PFESAs), and perfluoroalkyl(poly)ether acids (PFAA) precursors. Individual PFAS compounds are categorized based on the number of carbons in the chain, which vary from 4-18 carbons. An example of this can be seen in PFBA (n=4) and PFOA (n=8), both of which are PFCAs, however they vary greatly in chemical properties, applications, and toxicities. PFASs that will be measured in this study are shown in Table 1.1.

Table 1.1: A list of PFASs analyzed that include the chemical names, abbreviations, chemical makeup, and structure of targeted PFASs in Goatfish samples.

Chemical Name	Abbreviation	Chemical Makeup	Chemical Structure
Perfluorobutanoate	PFBA	C4F7O2	
Perfluoropentanoate	PFPeA	C5F9O2	
Perfluorohexanoate	PFHxA	C6F11O2	
Perfluoroheptanoate	PFHpA	C7F13O2	
Perfluorooctanoate	PFOA	C8F15O2	
Perfluorononanoate	PFNA	C9F17O2	
Perfluorodecanoate	PFUnA	C10F19O2	
Perfluorododecanoate	PFDoA	C12F23O2	
Perfluorotridecanoate	PFTrDA	C13F25O2	
Perfluorobutanesulfonate	PFBS	C4F9O3S-	
Perfluoropentanesulfonate	PFPeS	C5F11O3S-	
Perfluorohexanesulfonate	PFHxS	C6F13O3S-	

Perfluoroheptanesulfonate	PFHpS	C7F15O3S	
Perfluorooctanesulfonate	PFOS	C8F17O3S	
Perfluorononanesulfonate	PFNS	C9F19O3S	
Perfluorodecanesulfonate	PFDA	C10F21O3S-	
Perfluorododecanesulfonate	PFDoS	C12F25O3S-	
1H, 1H, 2H, 2H-perfluorohexane sulfonate	4:2 FTS OR H4-PFHxS	F(CF2)4CH2CH2SO3H	
1H, 1H, 2H, 2H-perfluorooctane sulfonate	6:2 FTS OR H4-PFOS	F(CF2)6CH2CH2SO3H	
1H, 1H, 2H, 2H-perfluorodecane sulfonate	8:2 FTS OR H4-PFDeS	F(CF2)8CH2CH2SO3H	
Perfluorooctanesulfonamide	PFOSA (FOSA)	C8H2F17NO2S	
N-methylperfluorooctanesulfonamide	N-MeFOSA	C9H4F17NO2S	
N-ethylperfluorooctanesulfonamide	N-EtFOSA	C10H6F17NO2S	
N-Methylperfluoro-1-octan sulfonamidacetic Acid	N-MeFOSAA	C11H6F17NO4S	
N-Ethylperfluoro-1-octanesulfonamidoacetic acid	N-EtFOSAA	C12H6F17NO6S	
N-Methylperfluoro-1-octanesulfonamidoethanol	N-MeFOSE	F(CF2)8SO2N(CH3)(CH2)2OH	

N-Ethylperfluoro-1-octanesulfonamidoethanol	N-EtFOSE	F(CF ₂) ₈ S O ₂ N(CH ₂ C H ₃)(CH ₂) 2OH	
Hexafluoropropylene oxide dimer acid	HFPO-DA	C3F ₆ O	
4,8-dioxa-3H-perfluorononanoate	ADONA	C ₇ H ₅ F ₁₂ NO ₄	
9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	9Cl-PF ₃ ONS	C ₈ CIF ₁₆ K O ₄ S	
11-chloroeicosafauro-3-oxaundecane-1-sulfonate	11Cl-PF ₃ OUdS	C ₁₀ CIF ₂₀ KO ₄ S	

Long chain PFASs are considered those with a chain of eight or more carbons attached to a carboxylic acid, or six or more carbons attached to a sulfonate, while short chain PFASs have less than six carbons (Buck et al. 2011). Specifically, PFCAs have a carboxyl functional group ($-COOH$) and are considered long-chain if they have seven or more perfluorinated carbons (Wang et al. 2017, Buck et al. 2011). Long chain perfluorooctane sulfonic acids (PFSAs) are defined as those with chains of six or more perfluorinated carbons and have a sulfonic acid functional group ($-SO_3H$) (Wang Zhanyun et al. 2017, Buck et al. 2011). The difference between the additional carbon defining a ‘long-chain’ in PFCA and PFSA is that PFSA is more likely to bioaccumulate with the same number of carbons compared to PFCA (Buck et al. 2011). Perfluorooctanoic acid (PFOA) is a PFCA and perfluorooctane sulfonate (PFOS) is a PFSA (Wang et al. 2017). The R

groups vary: PFCAs have –COOH, PFSAs have –SO₃H, PFPAs have –PO₃H₂, PFPIAs have –PO₂H–CmF_{2m+1}, PFECAs and PFESAs have –O–CmF_{2m+1}–R, and PFAA precursors have either –SO₂–R or –C₂H₄–R (Wang et al 2017).

Section 1.2: PFASs Chemical Properties

PFASs persist for a long time in the environment due to their chemical properties. PFASs are thermally and chemically stable because of the strong covalent bond of carbon to fluorine (C–F), which also makes both hydrophobic and oleophobic (Lau et al. 2007, Kiss 2001, IRTC 2020, Schultz 2003, Paul et al. 2009). The covalent bond between carbon and fluorine allows fluorine to shield carbon from forming bonds with other elements making the compound chemically stable; this bond increases the surfactant property and lowers surface tension (Kissa 2001, Buck et al. 2011, Lau 2007). This property allows for PFASs to greatly decrease aqueous surface tensions that contribute to both hydrophobic and oleophobic properties (Buck et al. 2011, Lau et al. 2007). Most PFASs are either stable or their degradation products end up highly stable under a variety of conditions such as water and heat exposure (Wang et al. 2017). The hydrophobic property of PFASs comes from fluorine's low polarization, resulting in weak intermolecular forces such as Var Der Waals or hydrogen bonding, which create hydrophobic and lipophobic properties (IRTC 2020, Kiss 2001).

PFASs are virtually non-biodegradable, resulting in them accumulating to become extremely abundant in the environment (Lau et al. 2007). In particular, PFOA does not biodegrade under aerobic or anaerobic conditions. However, both N-EtFOSE and FOSA were found to biodegrade after 18 days beneath activated sludge conditions, the part of the sewage treatment process when sewage is aerated with aerobic microorganisms to aid in breakdown (Schultz 2003). Bioaccumulation, the accumulation of a specific compound in an organism,

depends on the length and functional group of the specific PFASs. Long-chain PFASs, with seven or more fluorinated carbons, and PFASs with sulfonyl functional groups, have the highest potential for bioaccumulation (Condor et al. 2007).

Section 1.3: PFASs Uses and Production

PFASs are versatile because of their hydrophobic and lipophobic properties, which come from the C-F bond. The strong C-F bond allows for them to persist in the environment. The various applications of PFASs create different material properties that make their uses versatile. Aqueous Fire Fighting Foam (AFFF), a liquid mixture of various PFASs, is used worldwide to extinguish fires at military bases, airports, and during firefighter training. When AFFF is used, it is directly released into the environment, where it can be washed into waterways (Moody et al 2000). Often, fire training practices use copious amounts of AFFF in a single training session (Moody et al 2000). PFASs are also found in Teflon and Scotchgard. Teflon is a plastic coating that is commonly used for nonstick pans when cooking. This lining lets you cook food without it sticking to the pan itself, and when heated leaches PFASs. Scotchgard is applied via spray to upholstery to provide stain and water resistance and it can be applied to furniture, carpets, and newly installed fabric car seating. When Scotchgard is sprayed onto the product, it does not form a covalent bond to the material, and can wear down over time. PFASs are used for these applications, and countless others, due to their unique qualities.

Nearly 96,000 tons of perfluorooctane sulfonyl fluoride (POSF) were produced between 1970-2002 (Paul et al. 2009). Currently it is estimated that 260 tons of PFASs are produced annually (Prevedouros et al. 2006). Scientists have reported at least 12 different subclasses of PFASs with over 3,000 compounds produced worldwide (Wang et al. 2017). PFASs are produced by electrochemical fluorination (ECF) or telomerization (Moody et al. 2000). From

about the 1940s to early 2000s, 3M Company used ECF to produce PFASs, whereas DuPont developed telomerization fluorination to produce PFASs (Kissa 2001, Schultz 2003). The process of ECF occurs when organic compounds are fluorinated in an anhydrous hydrogen fluoride (Schultz 2003). The ECF reaction forms both perfluorinated sulfonyl and carbonyl fluorides, which are precursors for PFOS and PFOA, respectively (Schultz 2003). Perfluorinated sulfonyl and carbonyl fluorides vary in the number of carbons produced, from four to 14 carbon chains, with eight carbon chains being the most abundant (Schultz 2003). Telomerization is the process by which PFASs are produced by reacting a perfluoroalkyl iodide with tetrafluoroethylene (TFE) to produce even-numbered, straight, long-chained perfluoroalkyl iodides (Schultz 2003, Buck et al. 2011, Lau et al. 2007). Telomerization only produces even numbered linear fluorinated carbons, whereas ECF produces a mixture of linear and branched fluorinated carbons that vary in both even and odd numbers (Schultz 2003). Other companies that use telomerization include Asahi Glass, Atofina, Clariant, Daikin, National Foam, Ansul, Angus, Chemguard, and Buckeye (Schultz 2003, Place and Field 2012).

Production of AFFF started in the 1940s with PFCAs until production switched to POSF-based products in 1970s (Prevedouros et al. 2006). Polytetrafluoroethylene (Teflon) is produced using PFOA (Lau et al. 2007). The 3M Company voluntarily phased out the production of PFOS products and precursors in 2000, resulting in higher production of PFOA products; yielding approximately 1200 metric tons produced in 2004 (Lau et al. 2007). Other companies followed 3M and began to phase out PFOS production due to environmental concerns. In 2006 the EPA created the PFOA stewardship program which was designed to reduce PFOA production by 95% in 2010 and a commitment to eliminate PFOA products by 2015 (EPA 2019).

PFASs are used to produce AFFF, and are currently still used to produce Scotchgard, and Teflon from companies such as 3M, DuPont, Asahi Glass, Atofina, Clariant, Daikin, National Foam, Ansul, Angus, Chemguard, and Buckeye (Moody et al. 2000, Houde et al. 2008, Martin et al. 2001, Schultz 2003). The 3M company produces Scotchgard, a stain and water-resistant spray for both upholstery and carpet. DuPont produced Teflon, however, production has switched to sister company Chemours beginning in 2015.

Section 1.4: Transport and Exposure Routes to Aquatic Life

PFASs enter our waterways in a variety of different ways. They have been documented to come from wastewater treatment plants, industries, military use and urban runoff (Moody et al. 2000). Firefighting training leads to the use of AFFF which ends up in both our waterways and ocean. Analyses of firefighting practices have shown that PFASs contaminate drinking water, as well as end up in wastewater treatment plants (Moody et al. 2000). Beginning in the 1940s PFASs began to accumulate in the environment from pulsed releases due to fire fighting training, accidental manufacture release, and wastewater treatment plants. PFASs have also been known to enter waterways via sewage and solid waste discharge (Bezzera et al. 2019, EPA 2020). Additionally, Scotchgard can come off of the products it has been applied to, such as walking across the carpet and carrying excess Scotchgard outside, or by sitting on a couch and Scotchgard rubbing off onto clothing that will get washed, eventually ending up in waterways. PFASs also travel via air and water currents, which allows them to be globally persistent (Boisvert et al. 2019).

Once in the environment, PFASs have the ability to bioaccumulate in organisms because of their affinity for binding to proteins (Wang et al. 2017). PFASs have the ability to bind to both β -lipoproteins and the albumin and liver fatty acid-binding protein (L-FAB) (Lau et al. 2007).

Animal exposure can occur through several different pathways such as uptake via ingestion, inhalation, and dermal exposure. One route of exposure in fish occurs via ingestion; the compound is ingested by the organism either intentionally from prey or incidentally from sediment. Dermal exposure in fish occurs when the compound is able to enter the organisms via direct contact at the skin or from ventilation water moving over the gills (Loi et al. 2011). The predicted route of exposure for benthic feeding fish, such as goatfish, is through the ingestion of prey or accidental ingestion of sediments.

Various types of PFASs have been found in marine mammals, specifically in organs that are high in protein (Boisvert et al. 2019, Bossi et al. 2005). The highest concentrations of PFASs in polar bears from Greenland were found in the liver, consistent with PFASs binding to proteins (Bossi et al. 2005). Long-chain PFASs are more likely to bind with proteins than short-chain PFASs. Scientists have documented that long-chain PFASs and short-chain PFASs have different effects on organisms (Condor et al. 2007). Long-chain PFASs are able to cross the gut to blood barrier, which allow long chain PFASs to bioaccumulate. Short-chain PFASs do not cross this gut to blood barrier and will be excreted in feces. Loi et al. (2011) demonstrated this by finding short-chain PFBS present in high concentrations in the water, however, no PFBS were found in studied species of phytoplankton, zooplankton, and fish.

Section 2: Goatfish

Goatfishes are from the family Mullidae, and are distinguished by chemosensory barbels on their lower jaws that are used for finding food. They are bottom feeders that feed mostly on crustaceans or small fish (Hoover 2008). The target species for this study is *Parupeneus multifasciatus*, commonly known as the manybar goatfish. A red to gray color characterizes *P. multifasciatus* with a broad black bar on its back. It can also have splashes of yellow on it. *P.*

multifasciatus have a maximum length of 35 cm and are considered mature at 11 cm (Froese and Pauly 2000, Quoy and Gaimard 1825, Randall 2004). In Hawaii the legal catch size limit is 18 cm in fork length (DLNR 2020). *Parupeneus multifasciatus* are found in the Pacific Ocean, from the eastern Indian Ocean and across to both the Central and South Pacific Oceans, including the Hawaiian, Line, Marquesan, and Tuamoto Islands, southern Japan, and to Lord Howe and Rapa Islands (Froese and Pauly 2000, Randall 2004). *P. multifasciatus* can be found living in coral reefs, sandy bottoms, consolidated limestone structures, or shallow lagoons (Froese and Pauly 2000, Randall 2004).

Goatfish were chosen as the study species because they are found at all 14 study sites around O‘ahu (Table 1.2). For this study we will be examining only the fillets of the goatfish to assess potential risk of human exposure to PFASs. Goatfish are caught recreationally around Hawaii most commonly by spear fishing and are prized in Hawaii for a light and buttery flavor when cooked (Waikiki Aquarium 2020). Goatfish are near-shore benthopelagic species and not migratory indicating that contamination will most likely have occurred near capture location. Accidental sediment ingestion is an expected source of contamination with this species (HI DOH 2018). *Parupeneus multifasciatus* consumes a diet of crabs, shrimp, mollusks, and also demersal fish eggs (Froese and Pauly 2000, Randall 2004). Goatfish are listed as good inshore species for Hawaiian environmental risk assessments (HI DOH 2018).

Table 1.2: Site locations and reasoning behind sampling at each location.

Site Name	GPS location	Grouping	Reason
Kaena Point South	N21 33.894 W158 15.992	Reference	Kaena Point State Park, remote area with minimal human land use
Kaena Point North	N21 35.006 W158 15.388	Reference	Kaena Point State Park, remote area with minimal human land use

Kahuku	N21 41.960 W157 56.306	Reference	James Campbell National Wildlife Refuge, remote area with minimal land use
Waimanalo Gulch Landfill	N21 20.683 W158 08.109	Landfill	Suspected overflow from the landfill during heavy rains washing into ocean
Ewa Beach	N21 17.602 W 158 00.069	Urban	Runoff from two watersheds urbanized at 53% and 31%*
Ala Wai Harbor	N21 16.813 W157 50.823	Urban	Runoff from one watershed urbanized at 59%*
Honolulu Harbor	N21 17.693 W157 53.121	Urban	Runoff from two watersheds urbanized at 83% and 47%*, and runoff from Daniel K. Inouye International Airport
Hawaii Kai	N21 15.876 W157 43.016	Urban	Runoff from one watershed urbanized at 33%*
Ahuimanu	N21 29.257 W157 49.929	Sewage	Suspected contamination from high cesspool density
Kailua Regional Wastewater Treatment Plant	N21 27.963 W157 46.261	Sewage	Suspected contamination from secondary treated sewage discharged into the ocean via an effluent pipe
Haleiwa	N21 35.834 W158 08.173	Sewage	Suspected contamination from high cesspool density, drainage from Lake Wilson via Kaukonahua stream
Marine Corp Base Hawaii	N21 27.286 W157 46.568	Military/Airport	Known fire fighting training, storage for AFFF, active military airport
Pearl Harbor	N21 18.077 W157 56.787	Military/Airport	Two known and one potential release of PFASs due to firefighting training and storage at active military base with airport
Bellows	N21 21.773 W157 40.910	Military/Airport	Suspected firefighting training with use of AFFF at active military base

Section 3: Human Exposures

PFASs have been documented in human blood, urine, and breast milk samples (Steenland et al. 2009, Emmett et al. 2006, Rylander et al. 2010, Keller et al. 2010, Haug et al. 2011). Most

human exposures to PFASs are attributed to contaminated drinking water and food, such as fish (Emmett et al. 2006, Grandjean et al. 2012, Jian et al. 2018, Weihe et al. 2008). However, there may be some contributions from inhalation or unintentional ingestion of contaminated dust, depending on environmental sources. In the US, median levels of PFOA in the blood have been measured at 4 ng/mL (Steenland et al. 2009). PFASs have a 3-5 year half-life in human blood (Liew et al. 2018). Scientists have estimated half-lives of PFOS and PFOA in humans to be 5.4 years and 3.8 years respectively (Shankar et al. 2011, Steenland et al. 2009). PFASs exposure can start early via placental transfer of PFASs during pregnancy (Liew et al. 2018). A major exposure route for humans is suspected to be dietary, from fish or whale meat consumption (Grandjean et al. 2012, Weihe et al. 2008, Haug et al. 2011, Jian et al. 2018, Ericson et al. 2008).

Fish consumption is a major source of exposure in humans (Sunderland et al. 2018, Fair et al. 2019, Delinsky et al. 2009, Rylander et al. 2010, Zhao et al. 2011, Squadrone et al. 2014, Squadrone et al. 2015, Pico et al. 2018). Estimated daily intakes of PFOS from fish consumption varied by country, fish consumption rates, and fish species (Squadrone et al. 2014, Squadrone et al. 2015, Pico et al. 2018, Fair et al. 2019). A risk assessment on the consumption of fish indicated that consuming two eight-ounce flounder fillets per week could increase PFASs contamination in residents of South Carolina (Fair et al. 2019).

Both PFOA and PFOS were found in blood samples from US citizens over the age of 20 at concentrations ranging from 2.8 ng/mL to 5.9 ng/mL and 11.7 ng/mL to 29.5 ng/mL (Shankar et al. 2011). Ohio residents supplied water from the Little Hocking water service, which was suspected to be polluted from a fluoropolymer manufacturing company, had detectable concentrations of PFOA in their blood (Emmett et al. 2006). PFOA concentrations in the residential population were 60 to 75 times higher than median levels of the general population,

which was 5 ng/mL (Emmet et al. 2006). This study also documented higher levels of exposure in the ages most at risk for health complications: the elderly (over 60 years old), and the very young (2-5 years old). However, the exact reasons for the increased concentrations documented in the young and old age groups are unknown (Emmet et al. 2006).

Studies conducted on Faroe Island indicate PFASs contamination (Weihe et al. 2008, Grandjean et al. 2012). Scientists suspect that Faroe islanders have increased levels of PFASs in blood comes from high levels of marine intake, such as fish and whale meat, caught around Faroe island. Specifically children have increased levels of PFOS suspected to come from whale meat consumption (Grandjean et al. 2012, Weihe et al. 2008). In China, studies show higher levels of PFTA in human serum in children aged 12-15 years old attributed to a diet of mostly fish (Jian et al. 2018). Scientists speculate that the increased levels of PFASs present in some children could be because of the higher intake of seafood, leading to potential exposure for PFASs to enter the human body (Corsini et al. 2014, Weihe et al. 2008). Despite reducing whale meat meals to less than once per week and fish dinners to approximately once per week, PFOS concentrations increased between ages 7 and 14 while a 3-fold increase was seen in PFHxS concentrations (Weihe et al. 2008). This finding suggests that not only was whale meat a significant source of PFOS, but weekly fish consumption increased both PFOS and PFHxS concentrations. In Norway it is suggested that residents who subsistence fish have higher levels of PFASs in both blood and urine samples (Haug et al. 2011). Despite not stating the exact number of weekly fish meals, Norwegian residents that consume high levels of fish and fish liver have increased concentrations of PFOS, PFUnA, and PFOA (Haug et al. 2011). PFOS, PFHxS, and PFNA were detected in women's blood samples from Norway due to a dietary intake of fish and fish liver (Rylander et al. 2010). Ericson et al. (2008) examined PFOS concentrations in

blood from a population in Catalonia, Spain by comparing PFOS concentrations in local food samples to PFOS in blood samples. White fish (hake, whiting blue, sea bass, and monkfish) and blue fish (salmon, sardine and tuna) purchased at local supermarkets, origin of fish unknown, had PFOS concentrations of 0.407 ng/g and 0.654 ng/g respectively (Ericson et al. 2008).

Estimated daily intakes of PFOS for the population, age 4 to over 65 years old, ranged from 18.1 to 32.6 ng/g, and is suggested to come primarily from fish intake (Ericson et al. 2008).

Rylander et al. (2010) suggests that consuming over 100 g/day of fish or fish products will result in higher levels of PFOS in the blood. In China, the estimated daily intake of PFOS and PFOA were found to be 2.4 and 3.3 ng kg⁻¹bwd⁻¹ and in Hong Kong the estimated daily intake of PFOS and PFOA were 5.1 and 3.0 ng kg⁻¹bwd⁻¹, respectively (Zhao et al. 2011). In Italy, the estimated daily intake of PFOS from freshwater fish consumption ranged from 5.15-54.39 ng/kg/day (Squadrone et al. 2014, Squadrone et al. 2015). In Spain, the estimated daily intake of PFOS was 16 ng kg⁻¹bwd⁻¹ (Pico et al. 2018). These findings indicate there should be concern with the amount of fish that are consumed as part of the daily diet as they are most likely a major route of PFASs contamination.

Section 4: Toxicity

PFASs have been linked to a wide variety of negative health impacts affecting multiple organ systems, reproduction and development in both animals and humans. PFOS and PFOA are the compounds that have been studied the most thoroughly, but a growing body of scientific knowledge is showing significant toxic effects from many additional PFAS compounds. PFASs have been linked to cancer and thyroid conditions in rats (Corsini et al. 2014, Yang et al. 2000). These studies looked at thymic and splenic atrophy in mice exposed to PFOA during feeding times. Peden-Adams et al. (2008) found that mice exposed to PFOS concentrations similar to

that found in human serum, had reduced levels of antibodies found in the blood. Emmett et al. (2006) suggests that humans who were exposed to PFOA may exhibit immunocompromised effects. PFASs have additionally been linked to a number of childhood diseases including asthma, ADHD, low birth weights, immunomodulatory, neurodevelopment, and other reproductive and developmental effects (Anderko et al. 2020, Dong et al. 2013, Stein and Savitz 2011, Hoffman 2010, Liew et al. 2018). Research has begun to show a correlation between PFOA and PFOS concentrations and cancer (Kirk et al. 2018).

Children under the age of two are suspected to have the highest exposure of PFASs due to multiple exposures such as breast milk consumption and accidental dust inhalation (Liew et al. 2018). Studies suggest that children exposed to PFASs may have a decreased protection from vaccines (Grandjean et al. 2012, Liew et al. 2018). A correlation between mothers with high levels of PFASs during pregnancy gave birth to children who had lower vaccine antibodies for rubella, diphtheria, and tetanus (Liew et al. 2018). Lasting effects of decreased vaccine protection for both diphtheria and tetanus were found to last until the child was 13 years old (Liew et al. 2018). In the Faroe Islands, children aged five to seven showed decreased protection from both diphtheria and tetanus immunizations as PFAS concentrations in blood increased (Grandjean et al. 2012). PFAS concentrations in children aged 10-15 years old positively correlate with asthma (Dong et al. 2013). Liu et al. (2019) suggests that PFOA and PFOS may be associated with atopic dermatitis and asthma in young children. Exposure to PFASs at young ages correlates with various childhood diseases raising concern that early exposure to PFASs can have lifelong negative health impacts.

PFOA exposures in adults have been associated with several health implications, including testicular and genitourinary cancers, kidney cancer, kidney diseases, hyperlipidemia,

thyroid diseases, ulcerative colitis, and gestational hypertension (Stanifer et al. 2018, Shankar et al. 2011, Kirk et al. 2018). In US adults, exposure to PFASs has been linked to Chronic Kidney Disease (CKD) and high cholesterol (Shankar et al. 2011, Steenland et al. 2009). CKD positively correlates with increased levels of PFOA and PFOS blood concentrations in the US adult population. Scientists suspect that high levels of PFASs are found in the kidneys as these organs are a major route for the elimination of short-chain PFASs (Stanifer et al. 2018). PFASs have additionally been linked to high cholesterol in adults drinking contaminated water in Washington, West Virginia (Steenland et al. 2009). High cholesterol was found to be positively associated with increased concentrations of PFOA and PFOS in blood samples (Steenland et al. 2009). PFOA has been found to have a significant correlation to testicular and bladder cancers coming from a direct exposure in a manufacturing plant (Kirk et al. 2018). Exposure to both PFOA and PFOS are associated with increased health risks for the US population.

Eleven states, and the Great Lakes Consortium, have all placed PFOS advisory limits for the number of meals to consume per week, and which species to not eat based on the amount of suspected PFOS (EPA 2020). All state advisories are based on reference dose (RfD) of for allowable limits of PFOS, but the exact RfD varies for each state advisory (EPA 2020). Minnesota Department of Health advises consuming no more than one meal per week of fish not to exceed 40 ng/g of PFOS or one meal a month not exceeding 200 ng/g (Delinsky et al. 2009). Delinsky et al. (2009) found fish exceeding this concentration at five of the six sites studied in Minnesota. Alabama Department of Health recommends not consuming more than 800 ng/g of PFOS, which can vary between one meal a week or one meal a month, depending on the fish and capture location. Connecticut Department of Public Health (CDPH) has four levels of advisory: no consumption advice, 1 meal/week, 1 meal/month, and do not eat, depending on the species

and body of water the fish was caught. CDPH has two rivers thus far that have identified PFASs contamination, recommending that no more than one meal/month is consumed, resulting in 20-40 ng/g of PFOS contamination. Indiana, Minnesota, New Jersey, New York, Wisconsin, and the Great Lake Consortium all advise not to consume more than 200 ng/g of PFOS (EPA 2020).

Consuming more than the advised limits increases the chance of health issues based on toxicology studies.

In laboratory conducted experiments, PFOS has been documented to cause neurological development deficits, growth deficits, reproduction/mating problems, cellular stress, and respiration and behavioral issues in fishes (Zhang et al. 2011, Spulber et al. 2014, Hagenaars et al. 2014, Han and Fang et al 2010, Bao et al 2019, Bao et al. 2020, Chen et al. 2014, Chen et al. 2016, Dorts et al. 2011, Guo et al. 2014, Jantzen and Annunziatoet al. 2016, Jantzen et al. 2016, Keiter et al. 2012, Kim et al. 2020, Qiu et al. 2018, Shi et al. 2008, Wu et al. 2019, Xia et al. 2013, Yi et al. 2019, Du et al. 2008, Krovel et al. 2008, and Spachmo and Arukwe 2011). The vast majority of these studies have focused on zebrafish, with a few focusing on goldfish and salmon (Xia et al. 2013, Krovel et al. 2008, Spachmo and Arukwe 2011). In most studies zebrafish were exposed to various concentrations of PFOS for extended periods of time hours after fertilization took place (Zhang et al. 2011, Spulber et al. 2014, Hagenaars et al. 2014, Han and Fang et al 2010, Bao et al 2019, Bao et al. 2020, Chen et al. 2014, Chen et al. 2016, Dorts et al. 2011, Guo et al. 2014, Jantzen and Annunziatoet al. 2016, Jantzen et al. 2016, Keiter et al. 2012, Kim et al. 2020, Qiu et al. 2018, Shi et al. 2008, Wu et al. 2019, Yi et al. 2019, Du et al. 2008). Exposure limits for each study ranged from 0 to 32 mg/L of tank water, and varied by units and concentrations for each study. The lowest NOAEL concentrations were recorded at <0.02 µmols/L by Jantzen et al. (2016) affecting movements such as crossing frequency, distance

traveled in the tank, with LOAELS of 0.02. The highest NOAEL concentrations were recorded at 50 µg/L by Du et al. (2008) affecting growth, specifically male length and weight, with LOAELS of 250 µg/L.

Section 5: Biomagnification and Contamination

Section 5.1: Food Web Contamination: Biomagnification

Several studies have looked at how PFASs are transferred up the food chain via biomagnification (Loi et al. 2011, Houde et al. 2011, Martin et al. 2001, Houde et al. 2008, Bossi et al. 2005, Kannan et al. 2005). Greater levels of PFAS accumulation can be found in fish at the top of the food web compared to the bottom (MI DOE 2019, Zafeiraki et al. 2019). Persistent organic pollutants (POPs), specifically PFASs, are able to biomagnify (Loi et al. 2011). PFOS was also found to be in the highest concentrations at the top of the food chain (Kannan et al. 2005, Martin et al. 2001, Bossi et al. 2005).

One biomagnification study of PFASs looked at the food web from Mai Po Marshes Nature Reserve in Hong Kong (Loi et al. 2011). It was determined that the highest concentrations of PFASs in the liver of birds, secondary trophic levels, such as fish, had intermediate PFAS concentrations, while the lowest concentrations were found in gastropods. This result confirmed biomagnification in this ecosystem.

The ecosystem in Lake Ontario indicates PFASs, except for PFOA, biomagnify in lake trout, at the top of the food web (Martin et al. 2001). Lake trout have 170 ng/g of PFOS with its prey, smelt and alewife, having concentrations of 110 and 46 ng/g respectively found in whole body analysis of these species (Martin et al. 2001). This trend supports biomagnification in the food web of Lake Ontario through ingestion of prey. PFOS was found in the highest concentrations in sculpin at 450 ng/g (Martin et al. 2001). Sculpin are known to consume a diet

of mostly *Diporeia*, a common zooplankton species, which have high concentrations of PFOS at 280 ng/g leading to biomagnification and henceforth higher concentrations in Sculpin (Martin et al. 2001). *Diporeia* may have high concentrations of PFAS due to sediment contamination (Martin et al. 2011). A follow up study conducted by Houde et al. (2008) looked at the isomer transfer of PFOS from the bottom to the top of food chain and found that the BMF (Biomagnification Factor) was greater than one for trout, supporting the theory that biomagnification of PFOS was occurring in the Great Lakes food web. Predators of other fishes in the Great Lakes have PFOS concentrations up to 20-fold higher than their prey (Kannan et al. 2005). Invertebrates had the lowest levels of PFOS, while their predators, round gobies (*Neogobius melanostomus*), had concentrations 2-4 fold higher. Predators of round gobies, chinook salmon and lake whitefish, had PFOS concentrations 10 and 20 fold higher respectively (Kannan et al. 2005).

Greenland's marine mammal food web confirms PFASs biomagnification, as chemical concentrations increased from lower concentrations in shorthorn sculpin, through ringed seals, and ultimately to highest concentrations in polar bears (Bossi et al. 2005). The highest concentration of PFOSSs was found in polar bear livers, followed by the liver of the ringed seal, a major component in the polar bear diet (Bossi et al. 2005).

Section 5.2 PFAS Concentrations in Hawaiian Marine Organisms

Studies conducted in Hawaii have examined PFASs concentrations in seabirds, sea turtles, and various marine mammals (Figure 1.1) (Chu et al. 2015, Kurtz et al. 2019, Woods et al. 2021). Black footed albatross (*Phoebastria nigripes*) from Midway Atoll had detectable levels of PFASs in liver and adipose tissues (Chu et al. 2015). The highest concentrations were found in the liver, with PFOS being the most abundant (Chu et al. 2015). This finding is consistent with

the way PFASs bind and accumulate in specific tissues (Fair et al. 2019, Hart et al. 2008). PFASs that were below the detection limit in this study were PFBA, PFPeA, and PFBS—all short carbon chains (Chu et al. 2015). This finding is consistent with short chain PFASs being excreted. When comparing sampled albatross from 2011 to a previous study in the 1990s it was determined that liver concentrations increased 7-fold (Chu et al. 2015).

Stranded cetaceans around Hawaii had detectable PFAS concentrations in the liver and kidneys with higher concentrations in the liver (Kurtz et al. 2019). PFUnA was present in the highest concentration, followed by PFOS (Kurtz et al. 2019). PFASs that were not detected were PFBA, PFPeA, PFHpA, and PFBS (Kurtz et al. 2019). The absence of these PFASs in cetaceans around Hawaii could indicate that they will not be present in goatfish around O‘ahu either. Juveniles were found to have the highest median concentrations of PFASs compared to adults and calves, suspected to come from parental offloading during nursing (Kurtz et al. 2019). Maternal offloading has been observed in oviparous species (Wood et al. in press), adult female goatfish would be expected to have lower PFAS concentrations than adult males. Oviparous transfer of PFOS was also indicated in salmon with higher concentrations of PFOS in salmon eggs compared to the mother, indicating oviparous transfer of PFOs during gestation periods (Kannan et al. 2005).

A study focusing on sea turtles around the Hawaiian Islands found PFAS concentrations in both the plasma and egg samples (Woods et al. 2021). PFOS predominated in green sea turtles whereas PFNA predominated in hawksbill turtles. Woods et al. (2021) suggests this could be due to elimination mechanisms, prey selection, or migratory patterns. This pattern could suggest that goatfish may exhibit different PFASs concentrations based on diet or elimination mechanisms, since goatfish do not migrate. Hawksbill nest PFASs concentrations are highest near

international airports potentially from point source contamination from AFFF (Woods et al. 2021). This finding suggests that PFASs concentrations in Hawaiian goatfish are expected to be highest near airports.

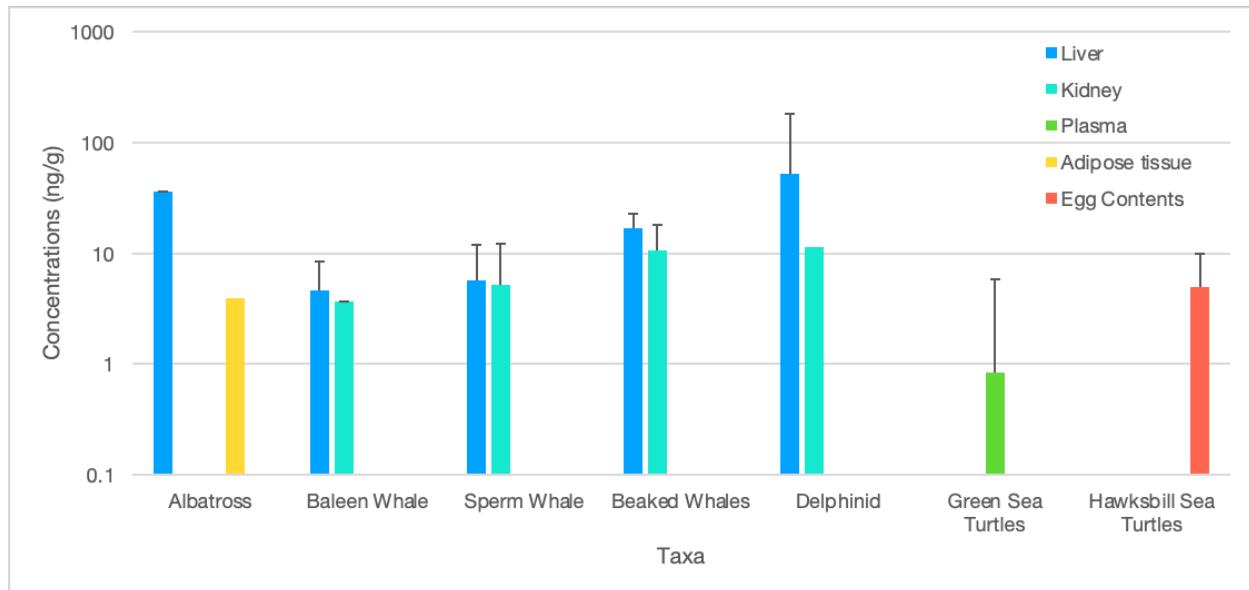


Figure 1.1: Concentrations of PFOS for various species around Hawaii on a log scale. Error bars are based on standard deviations from raw data provided (Woods et al. 2021, Kurtz et al. 2019). Standard deviations were not provided for albatross (Chu et al. 2015).

Section 5.3 PFAS in Fishes

PFASs are known to distribute across different tissues heterogeneously. PFAS bind to protein rich organs (Hart et al. 2008, Kannan et al. 2005, Shi et al. 2009, Fair et al. 2019) and thus are found predominantly in the blood and liver, and less often in fat or muscle (Hart et al. 2008). Relevant fish studies have found PFASs in fish fillets (Hart et al. 2008, Fair et al. 2019, MI DOE 2019, Goodrow et al. 2018, Ye et al. 2008, Kannan et al. 2005, Shi et al. 2009, Martin et al. 2001, Ahrens et al. 2016, Olivero-Verbel et al. 2005, Wu et al. 2011, Cerveny et al. 2015, Delinsky et al. 2009). Most of these studies have focused on freshwater species, however, a few

focused on marine species. A list of studies with detectable PFASs in fish fillets is found in Table S1 (Appendix A).

PFASs concentrations have been documented to be higher in the water than in fish (Cerveny et al. 2015, Hart et al. 2008). A study in the Czech Republic compared PFASs concentrations in wild chubs (*Squalius cephalus*) to passive samplers at various locations (Cerveny et al. 2015). The fish liver and muscle tissue were analyzed for PFASs concentrations, PFOS was detected in the highest concentrations. Only PFOS was detected in muscle tissue (Cerveny et al. 2015). PFNA, PFHpA, PFHxA, and PFPeA were additionally found in chub livers (Cerveny et al. 2015). Passive samplers were able to detect concentrations of PFOS, PFNA, PFOA, PFHxS, PFHpA, PFHxA, and PFPeA from the water at all sampled sites (Cerveny et al. 2015). Strong positive correlations were found between passive sampler concentrations and chub liver concentrations for PFOS, PFNA, PFHpA, PFHxA, and PFPeA, additionally positive correlations were found in PFOS and muscle tissues (Cerveny et al. 2015). The most prevalent compound found in fish was PFOS (Hart et al. 2008, Fair et al. 2019, MI DOE 2019, Goodrow et al. 2018, Ye et al. 2008, Kannan et al. 2005, Shi et al. 2009, Martin et al. 2001, Ahrens et al. 2016, Olivero-Verbal et al. 2005, Wu et al. 2011, Cerveny et al. 2015, Delinsky et al. 2009).

Tuna livers were analyzed for 9 different PFASs, having PFOS and PFUnA found at the highest concentrations (Hart et al. 2008). This finding is consistent with other studies having PFOS in high concentrations in fish (Hart et al. 2008, Fair et al. 2019, MI DOE 2019, Goodrow et al. 2018, Ye et al. 2008, Kannan et al. 2005, Shi et al. 2009, Martin et al. 2001, Ahrens et al. 2016, Olivero-Verbal et al. 2005, Wu et al. 2011, Cerveny et al. 2015, Delinsky et al. 2009). PFUnA concentrations were higher than PFOS concentrations at both open-ocean and offshore

sites (Hart et al. 2008). Since PFUnA was not detected in water samples collected where the skipjack tuna were caught, it suggests exposure came from a different location due to the long migration of skipjack tunas (Hart et al. 2008). PFOA was found in highest concentrations in the surrounding waters, however, it has a low bioaccumulation factor and was not found in the livers (Hart et al. 2008). PFOA will likely not be found in goatfish because of its low level on the food chain.

A study showed that both PFOS and PFDA were primarily detected in piscivores, whereas PFBS was primarily detected in non-piscivores (Ahrens et al. 2016). Herbivores and omnivores had higher concentrations of short-chain PFASs whereas piscivores had higher concentrations of long-chain PFASs (Ahrens et al. 2016). Scientists suspect that short-chain PFASs are present in plants that the omnivores and herbivores consume leading to higher concentrations in those fish (Ahrens et al. 2016). Since short-chain PFASs concentrations may be linked to herbivores and omnivores, it is likely that long-chain PFASs concentrations are linked to carnivores. Carnivorous goatfish are expected to have higher concentrations of long-chain PFASs.

O‘ahu has several suspected point sources of PFAS contamination, similar to a study in Colombia where fish were sampled near industrial and urban sewage discharge, petrochemical processing, pesticide packaging, and oil refining on Cartagena Bay (Olivero-Verbal et al 2005). PFOS, PFOA, and PFHxS were found in all sampled fish (Olivero-Verbal et al 2005). This finding could indicate that PFOS, PFOA and PFHxS could be found in Hawaiian goatfish located near suspected sewage release locations such as Kailua WWTP, Ahuimanu, and Haleiwa. In another study, Bluegill sunfish from both Minnesota and North Carolina were chosen to study

based on their small home range, indicating that contamination would come from the immediate environment (Delinsky et al. 2009, HI DOH).

A study compared the concentrations of PFASs in fish fillets to concentrations of PFASs found in whole fish caught from subsistence fishing in South Carolina (Fair et al. 2019). The comparison between whole fish and fish fillets found almost all detectable PFASs present in both fillets and whole fish but in different concentrations, with concentrations higher in whole fish samples. This difference in concentrations of PFASs detected could be due to PFASs partitioning differently in some organs as compared to the muscle of a fillet, leading to some PFAS present in whole fish which would be undetectable in a fillet. It could also indicate that different PFASs are present in the prey. Lower concentrations in fish fillets were suspected since they only consisted of muscle tissue, whereas whole fish concentrations also included organs, such as liver which accumulates higher PFAS levels. The PFASs found in the highest concentration were PFOS in all sampled species (Fair et al. 2019).

Fish fillet concentrations varied by fish species and location, but PFOS was predominantly found in all fish muscle (Fair et al. 2019, Delinsky et al. 2009, Wu et al. 2011, Zhao et al. 2011, Cerveny et al. 2015, Shi et al. 2009, Peng et al. 2010, Squadrone et al. 2014, Squadron et al. 2015, Bhavsar et al. 2014, Goodrow et al. 2020, Mazzoni et al. 2020, Pan et al. 2014, Labadie et al. 2011, Ahrens et al. 2016, Ruffle et al. 2020). Fish muscle in these studies were from both marine and freshwater sources, with freshwater sources showing slightly higher PFOS concentrations (Figure 1.2). It appears that freshwater fish have higher concentrations than marine fish, potentially because freshwater systems are more enclosed such as lakes. Goatfish concentrations will most likely be lower than freshwater fish concentrations. Tibetan Plateau fish show lower concentrations of PFOS than in other freshwater fish, however, have higher PFOS

concentrations than marine fish, indicating that this remote environment may not be as pristine as once thought (Shi et al. 2009). Besides PFOS, PFNA, PFUnDA, PFTrDA, and PFOSA were also found in this environment, showing that these compounds are found in remote places and could potentially be found in fish around O‘ahu. Overall, these studies indicate that goatfish around O‘ahu will most likely have PFOS concentrations. Goatfish PFOS concentrations will most likely be less than what was found in marine studies conducted in China, because of high levels of pollution and highly urbanized areas in that region (Wu et al. 2011, Zhao et al. 2011, Peng et al. 2009).

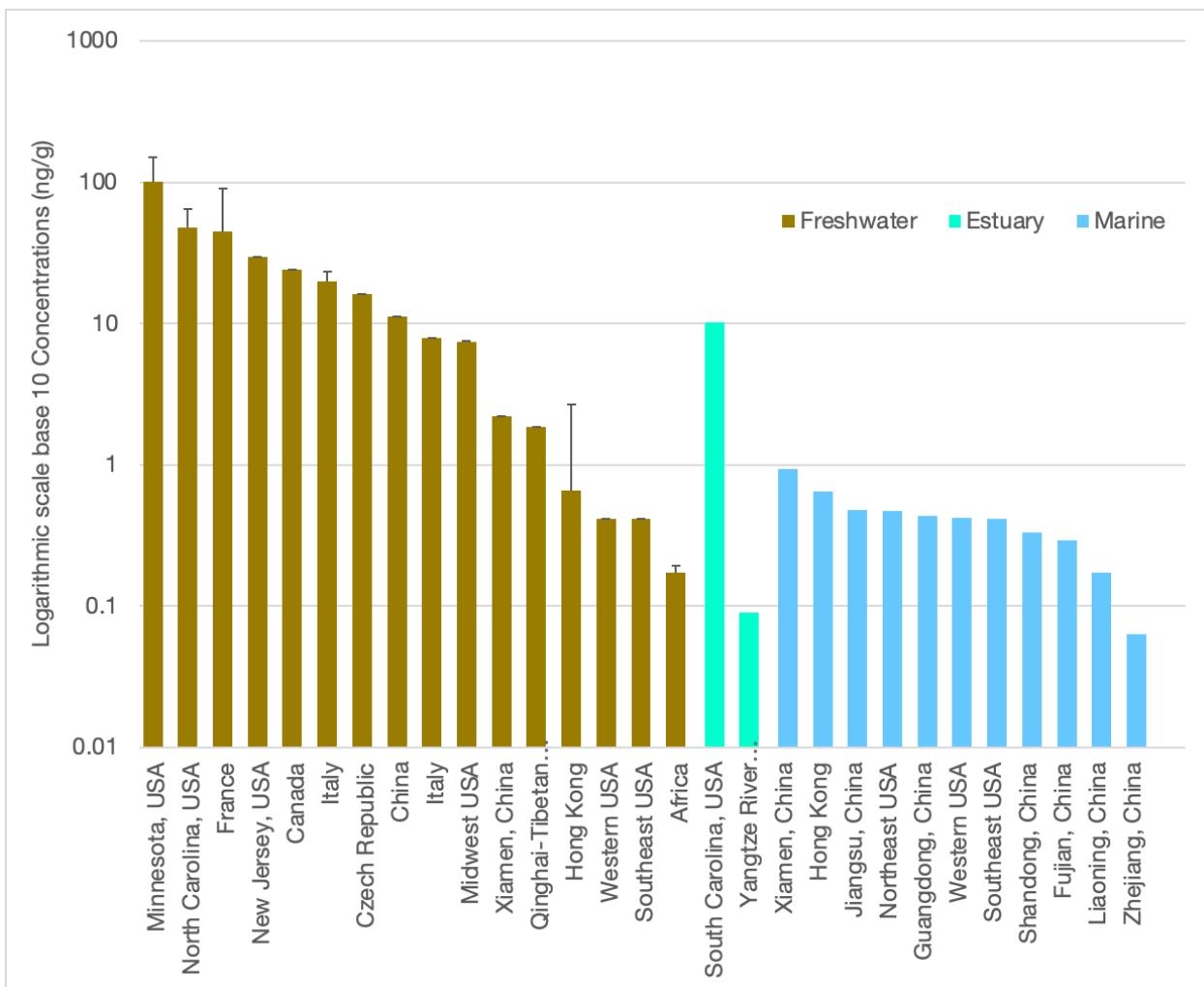


Figure 1.2: Concentrations of PFASs in fish fillets world wide. Brown bars indicate fresh water, teal bars indicate estuary, and blue bars indicate freshwater. Error bars are standard deviation and are shown only when the publication reported it. (Cerveny et al. 2015, Delinsky et al. 2009, Shi et al. 2009, Squadrone et al. 2014, Zaho et al. Fair et al. 2019, Peng et al. 2010, Wu et al. 2011, Bhavsar et al. 2014, Goodrow et al 2020, Mazzoni et al. 2020, Pan et al. 2014, Labadie et al. 2011, Ahrens et al. 2016, Ruffle et al. 2020).

Chapter 2

Perfluoroalkyl Substances (PFASs) in Manybar Goatfish Around O‘ahu

Abstract

Perfluoroalkyl substances (PFASs) are known environmental pollutants found world wide. This study examined the PFASs concentrations in goatfish, *Parupeneus multifasciatus*, a common inshore reef fish caught in recreational and subsistence fisheries around O‘ahu, Hawaii. Forty-two fish were collected from 14 sites around O‘ahu, split into five groups: reference, landfill, sewage, ruban, and military/airport. Fish fillets were examined for 33 compounds by liquid chromatography tandem mass spectrometry. Three PFASs, perfluorooctane sulfonic acid (PFOS), perfluoroundecanoic acid (PFUnA), and 6:2 fluorotelomer sulfonate (6:2 FTS) were detected in some goatfish. Statistically only PFOS had significantly different concentrations

among sites, with Ahuimanu and Pearl Harbor having greater concentrations than other sites ($p=<0.05$). PFOS was detected in all three fish from both Ahuimanu and Pearl Harbor, indicating potential point sources near these sites. 6:2 FTS concentrations were significantly greater at the military/airport site groups than the reference site groups ($p=0.03$). 6:2 FTS tended to be greater at military/airport sites than other urban areas ($p=0.08$). The average human daily intake from consuming goatfish was determined to be 0.113 ng/kg/day of PFOS, which is 30 times lower than fish consumption advisories. The goatfish PFOS concentrations (0.16 ng/g) were six orders of magnitude lower than previously reported no observable adverse effect levels (NOAEL) for fish, so no toxicity risk is currently predicted for this population of fish.

Introduction

Perfluoroalkyl substances (PFASs) are toxic, persistent, environmental contaminants, some of which have been listed as chemicals of concern by the Environmental Protection Agency (EPA) and the Stockholm Convention (Cerveny et al. 2015, Gallen et al. 2018). PFASs are chains of carbons bonded to fluorine atoms with a functional group attached ($C_nF_{2n+1}-R$); the C-F bond is extremely strong leading to their persistence (Buck et al. 2011, Wang et al. 2017). PFAS is a general term used to describe both perfluoroalkyl and polyfluoroalkyl substances, more broadly described as fluorinated polymers, which is a large complex family of compounds with varying physical and chemical properties (Buck et al. 2011). PFASs are known for their oleophobic and hydrophobic properties, making them useful in many products. Over 3000 PFAS compounds are in production today. PFASs are used in aqueous fire fighting foams (AFFF), and are currently used to produce waterproofing and stain resistant products from companies such as 3M, DuPont, Asahi Glass, Atofina, Clariant, Daikin, National Foam, Ansul,

Angus, Chemguard, and Buckeye (Moody et al. 2000, Houde et al. 2008, Martin et al. 2001, Schultz 2003). AFFF is used to extinguish massive fires, directly entering the environment (Moody et al. 2000). Additionally, products such as food packaging and nonstick cookware are lined with PFAS and can be directly ingested by humans or released in the environment indirectly (Herzke et al. 2012, Schultz et al. 2009). Wastewater has been documented to contain high levels of PFASs, which are not removed by traditional wastewater treatment processes (Gallen et al. 2018).

PFASs have been documented in human blood, urine, and breastmilk and have been linked to various toxic effects in humans, such as increased birth defects, low birth weights, increased liver sizes, ADHD, high cholesterol, asthma, decreased vaccine protection, and cancer (Anderko et al. 2020, Dong et al. 2013, Stein and Savitz 2011, Hoffman 2010). Fish consumption is one of the leading routes for human exposure to PFAS (Sunderland et al. 2018, Fair et al. 2019, Delinsky et al. 2009, Rylander et al. 2010, Zhao et al. 2011). Multiple studies have reported PFAS concentrations in fish, with PFOS and PFOA being most prevalent (Hart et al. 2008, Fair et al. 2019, MI DOE 2019, Goodrow et al. 2018, Ye et al. 2008, Kannan et al. 2005, Shi et al. 2009, Martin et al. 2001, Ahrens et al. 2016, Olivero-Verbel et al. 2005, Wu et al. 2011, Cerveny et al. 2015, Delinsky et al. 2009).

In the Hawaiian Islands, O‘ahu is suspected to have several point sources of PFAS contamination. Military bases and airports are known locations that store and use AFFF (Moody et al. 2000, Schultz 2003), and O‘ahu has eleven military bases and one international airport. AFFF may directly contaminate the surrounding environment following its use. Sewage and wastewater discharges are suspected to have elevated levels of PFASs contamination (Schultz 2003). Landfills contain discarded items covered in stain and waterproofing materials leading to

leachate containing high concentrations of PFASs (Lang et al. 2017). Landfills can be flooded during intense rainstorms, leading to an overflow of containment and runoff into the surrounding environment. Urban runoff also has detectable concentrations of various PFASs (Houtz et al. 2012, Chen et al. 2017).

On O‘ahu it is suspected that fish consumption may lead to human PFASs exposure. The many-bar goatfish, *Parupeneus multifasciatus*, or moano in the Hawaiian Language, is a nearshore, benthopelagic species, and not migratory, which indicates that any contamination in the fillets would have most likely occurred near the capture location through prey or accidental sediment ingestion (HI DOH 2018). Goatfish are listed as good inshore species for Hawaiian environmental risk assessments (HI DOH 2018). Goatfish are commonly caught in recreational and subsistence fisheries. The objectives of this study were to: 1) determine the types and concentrations of PFASs found in goatfish around O‘ahu, 2) compare PFAS levels in goatfish among different sites around O‘ahu, to fish from other locations, and to known toxicity thresholds, and 3) prepare an estimate of the daily intake of PFASs by people living on O‘ahu.

Methods

Fish collection and processing

Three many-bar goatfish, *Parupeneus multifasciatus* (family Mullidae), were collected from each of 14 sites (Table 2.1) around O‘ahu based on suspected and known land use for possible PFAS contamination sources from military/airport installations, urban runoff, sewage runoff from wastewater treatment plants (WWTPs) or cesspools, and landfills, along with minimally impacted reference sites (Figure 2.1).

Table 2.1: Site locations, groupings, and reason for site selection

Site Name	GPS location	Grouping	Reason

Kaena Point South	N21 33.894 W158 15.992	Reference	Kaena Point State Park, remote area with minimal human land use
Kaena Point North	N21 35.006 W158 15.388	Reference	Kaena Point State Park, remote area with minimal human land use
Kahuku	N21 41.960 W157 56.306	Reference	James Campbell National Wildlife Refuge, remote area with minimal land use
Waimanalo Gulch Landfill	N21 20.683 W158 08.109	Landfill	Suspected overflow from the landfill during heavy rains washing into ocean
Ewa Beach	N21 17.602 W 158 00.069	Urban	Runoff from two watersheds urbanized at 53% and 31%*
Ala Wai Harbor	N21 16.813 W157 50.823	Urban	Runoff from one watershed urbanized at 59%*
Honolulu Harbor	N21 17.693 W157 53.121	Urban	Runoff from two watersheds urbanized at 83% and 47%*, and runoff from Daniel K. Inouye International Airport
Hawaii Kai	N21 15.876 W157 43.016	Urban	Runoff from one watershed urbanized at 33%*
Ahuimanu	N21 29.257 W157 49.929	Sewage	Suspected contamination from high cesspool density
Kailua Regional Wastewater Treatment Plant	N21 27.963 W157 46.261	Sewage	Suspected contamination from secondary treated sewage discharged into the ocean via an effluent pipe
Haleiwa	N21 35.834 W158 08.173	Sewage	Suspected contamination from high cesspool density, drainage from Lake Wilson via Kaukonahua stream
Marine Corp Base Hawaii	N21 27.286 W157 46.568	Military/Airport	Known fire fighting training, storage for AFFF, active military airport
Pearl Harbor	N21 18.077 W157 56.787	Military/Airport	Two known and one potential release of PFASs due to firefighting training and storage at active military base with airport

Bellows	N21 21.773 W157 40.910	Military/ Airport	Suspected firefighting training with use of AFFF at active military base
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Figure 2.1: Map of O‘ahu, Hawaii, with 14 sites at which goatfish were collected. Areas outlined in red have high cesspool density (HI DOH 2017).

Fish were captured by hook and line or spear fishing by a commercial fisherman.

Precautions were taken, such as using gloves and methanol rinsed foil to wrap the fish, to ensure that external PFAS contamination was avoided, and fish were stored in a cooler with -80 °C freeze packs. Fish were collected between November 2019 and May 2020. Fish were weighed to the nearest 0.1 g, measured for total and fork length and stored in methanol-rinsed foil at -80 °C until dissection.

For dissection, stainless steel knives, forceps, scalpel handles, and scissors were cleaned and methanol rinsed (Sigma-Aldrich >/=99.9 %) prior to use on each fish. A sterile disposable stainless steel scalpel blade was used per fish directly from manufacturer packaging without extra cleaning. The left fillet was removed first and placed skin down on methanol-rinsed aluminum foil. The muscle was removed from the skin and placed in a ceramic mortar and pestle (pre-cleaned with MilliQ filtered water and methanol) for homogenization to a fine paste. The homogenized samples were transferred to 50 mL polypropylene centrifuge tubes and frozen at -80 °C. The gastrointestinal tract, liver, and right fillet with skin were removed, placed in separate foil pouches, weighed, and frozen at -80 °C for archival purposes.

Field blanks were created by mimicking steps taken during fish collection and processing. Twelve mL of MilliQ water were placed in three glass jars. The jars were opened on the boat, while wearing the fisherman's glove, and the three-prong tip of the fish spear was immersed in the water samples to account for possible contamination in the field. In the lab, the water samples were poured into a methanol-rinsed foil pouch, placed on the fish measuring board, and then frozen at -80 °C. Water samples were thawed and poured into a mortar, touched with the precleaned fillet knife, forceps, scissors, scalpel blade, ground with a pestle, transferred into centrifuge tubes and frozen.

Chemical Analytical Methods

The homogenized fillet samples and field blanks were sent to SGS AXYS Analytical Services Ltd. in Sydney, BC, Canada for analysis according to SGS AXYS method MSU-110 (detailed methods are available from AXYS, but are provided via a confidential report). Samples were analyzed for 33 PFASs (Table S2 in Appendix A). Fish muscle homogenate and field blank water samples were first spiked with an isotopically-labeled surrogate standard solution

containing 24 of PFAS compounds. Samples were extracted with methanolic potassium hydroxide solution, with acetonitrile, and again with methanolic potassium hydroxide solution collecting supernatants each time. Supernatants were combined, diluted with water, and cleaned up using solid phase extraction on a weak anion exchange sorbent. The eluate was spiked with recovery standards, and analyzed using liquid chromatography tandem mass spectrometry (LC/MS/MS). Method limits of detection (MLODs) and limits of quantification (MLOQ) determined according to SGS AXYS method MLA-110 were provided in reports from SGS AXYS. Laboratory blanks and NIST Standard Reference Material (SRM) 1947 Lake Michigan Fish Tissue were analyzed to assess the performance of the analytical method. A six-set calibration curve containing a mix of 33 PFASs and the internal standard quantification approach was used to quantify PFASs concentrations in fish.

Statistics and Data Handling:

Program R NADA was necessary to appropriately handle the many fish samples that had PFAS concentrations below the reporting limit (RL) (Helsel 2005). Summary statistics were calculated on individual sites, site groupings, and all O‘ahu fish (using function censtats). Choices between regression on order (ROS) or maximum likelihood estimation (MLE) were made according to Table 6.11 in Helsel (2005). The MLE summary statistics were chosen when standard deviations were zero in ROS because they were more representative of the sample values. When the NADA models produced a rank-deficient fit warning, indicating that statistical results were misleading, non-detect values were substituted with half the reporting limit and summary statistics were calculated in Microsoft Excel. The parametric or non-parametric versions of analysis of variance (ANOVA) in NADA, using cennle or cendiff functions, were performed to compare concentrations among sites and among site groupings. Non-parametric tests were chosen when normality and heteroskedasticity assumptions were not met for

parametric tests. Kendall's tau correlations (cenken function) were examined for correlations among fish total length, fish fork length, fish depth, liver:body mass ratio, fish mass, and PFOS, PFUnA, and 6:2 FTS concentrations. Site and site grouping differences in fish length, mass and depth were examined in JMP (SAS Institute Inc. Cary, NC).

To determine the average daily intake of fish by people on O'ahu, Hawaii, a similar approach was used from Squadrone et al. 2014 and Squadrone et al. 2015. The estimated human dietary intake (EHDI) of PFASs was determined using the following equation

$$\text{EHDI} = (\text{C} * \text{DC}) / \text{BW}$$

Where C is the mean concentration in goatfish, DC is the daily intake of fish by the Hawaiian population (estimated to be 42.52 g/day; Baker et al. 2020), and BW is the average body weight standardized to 60 kg as in Squadrone et al. (2014, 2015). In America the average body weight is 82.6 kg (Vakharia 2016), so a more accurate EHDI was calculated with this BW. A reference value of 150 ng/kg/day was used to determine potential risk from fish consumption (Squadrone et al. 2014, 2015, Leclercq et al. 2009)

Results and Discussion:

Fish were caught in depths ranging from 4.5 to 30.5 meters, fish total lengths ranged from 18.5 cm to 28.7 cm, fork length ranged from 15.9 cm to 25.1 cm, and masses ranged from 69.1 g to 299.3 g (all metadata and detectable concentrations of PFAS per fish are provided in Table S3 in Appendix A). All sampled goatfish were suspected to have reached maturity, because length at maturity is 11 cm for this species (Froese and Pauly 2020).

All quality assurance/quality control procedures were acceptable. PFAS concentrations were below detection in the field blanks (n=3). Reporting limits are provided in Table S3 in Appendix A. The PFOS concentration measured in NIST SRM 1947 was 5.71 ng/g, which is

within the uncertainty of the certified value of 5.9+/-0.39. The recoveries of mass labeled internal standard compounds from the 42 fish samples ranged from 82.1 % to 111 % for 13C8-PFOS, 76.4 % to 119 % for 13C7-PFUnA, and 67.5 % to 143 % 13C2-6:2 FTS (Appendix [B](#)).

Fish muscle samples were tested for 33 PFASs compounds, all data are provided in Appendix B. Only three PFASs were detected in the goatfish: PFOS, PFUnA, and 6:2 FTS (Table S4 in Appendix A). Detected concentrations of PFUnA ranged from 0.192 ng/g to 0.246 ng/g, PFOS from 0.262 ng/g to 0.766 ng/g, and 6:2 FTS from 0.824 ng/g to 5.59 ng/g. The median, mean, and standard deviation of PFUnA, PFOS, and 6:2 FTS for all fish from O‘ahu were 0.146 ng/g, 0.0746 ng/g, 0.0622 ng/g; 0.150 ng/g, 0.160 ng/g, 0.353 ng/g; and 0.0274 ng/g, 0.200 ng/g, 0.916 ng/g, respectively (Table S4 in Appendix A).

PFUnA was detected in only 4 of the 42 fish in this study, and they were from Haleiwa, Landfill, and Kahuku sites. 6:2 FTS was detected in 7 fish from Kailua WWTP, Haleiwa, Marine Corps, Bellows, Pearl Harbor, and Honolulu Harbor. No site differences were found for PFUnA or 6:2 FTS (Table S4 in Appendix A, Figure 2.2). PFOS was detected in 8 fish from Ahuimanu, Pearl Harbor, Ewa Beach, and Kaena Point North. All three fish from two sites had detectable PFOS concentrations, Ahuimanu and Pearl Harbor. Statistically, fish from Ahuimanu had greater PFOS concentrations than all sites except Ewa Beach ($p<0.05$). Fish from Pearl Harbor had greater PFOS concentrations than all sites except Kaena Point North and Ala Wai ($p<0.05$).

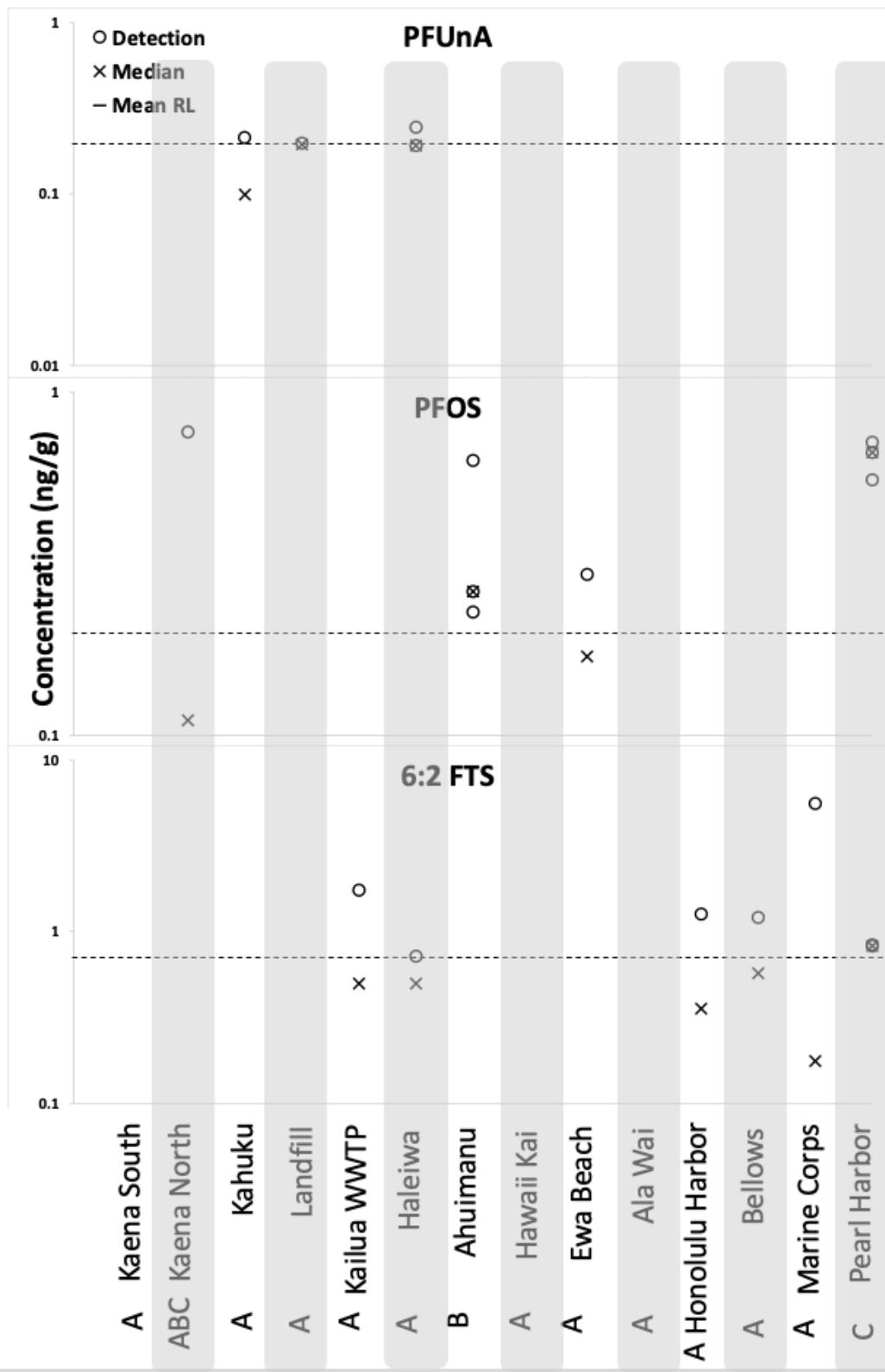


Figure 2.2: An all site comparison of detected concentrations of PFUnA, PFOS, and 6:2 FTS (open circles) with site medians calculated from NADA (X), and the average reporting limit across all fish (black dotted lines). Fish samples below the reporting limit are not shown. Site names sharing the same letter(s) do not significantly differ in PFOS concentrations. No significant differences were observed among sites for PFUnA or 6:2 FTS.

Pearl Harbor was the most contaminated site, which was expected because of suspected potential point sources, such as used and stored AFFF. Ahuimanu is likely elevated in PFOS contamination because of the high numbers of cesspools located in the area, which lead to untreated wastewater runoff. Surprisingly, the reference sites had detectable concentrations of PFASs. Kahuku had one fish with detectable concentrations of PFUnA and Kaena Point North had one fish with PFOS. Kaena Point South was the only reference site that had no detectable concentrations of PFASs. The presence of detectable concentrations at the reference sites is not completely surprising. Remote regions of the globe are contaminated with PFASs that are carried by atmospheric and ocean currents (Boisvert et al. 2019). Hawaii experiences this problem (Wood et al. 2021), and the reference site concentrations may represent the baseline background level of PFASs expected in subtropical regions of the ocean. Alternatively, the reference site fish could have been older with more time to accumulate PFASs in their tissues, but an investigation of fish length and mass revealed no significant differences among sites or site groupings (Figure 2.3). It is also possible that the reference fish could have been exposed elsewhere and moved into the reference sites before sample collection, but this is not likely as goatfish do not migrate far distances. Finally, nearshore currents could potentially deliver PFASs from upstream point sources towards these northerly reference sites, however inshore currents around O‘ahu are inconsistent and not reliable (Figure 2.4). Figure 2.4 shows the nearshore currents around O‘ahu

from the time fish were collected by monthly Hawai'i Ocean Time-Series (HOT) cruises conducted by School of Ocean and Earth Science and Technology (SOEST) at University of Hawai'i at Manoa (UH) (SOEST UH 2021). In fish, the half-life of PFOS is about 10 to 15 days (Hassel et al. 2020, Wu et al. 2019). Benthic fish appear to have longer half lives at 15-16 days, allowing us to suspect a similar half life in goatfish (Hassel et al. 2020). Since the data on nearshore currents are aligned with the timing of fish collection, they may represent the duration of PFASs bioaccumulation in the sampled goatfish (Hassel et al. 2020). Current data provide a five-month view of the variable nature of nearshore currents, variability that is well known and makes it impossible to identify a prevailing current (N. Maximenko, personal communication). The current data may indicate that fish at the reference site may be exposed intermittently to PFASs brought up from the south shore of O'ahu.

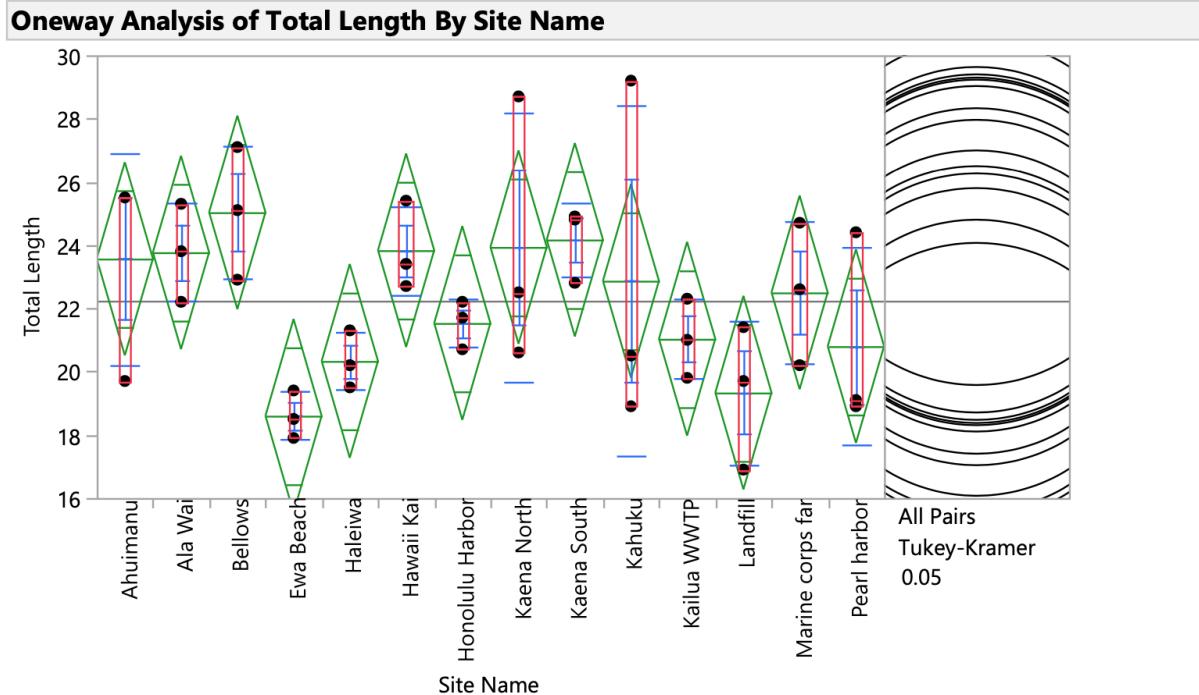


Figure 2.3: No significant differences between fish mass and individual site differences.

P-values range from 0.179 to 1.0.

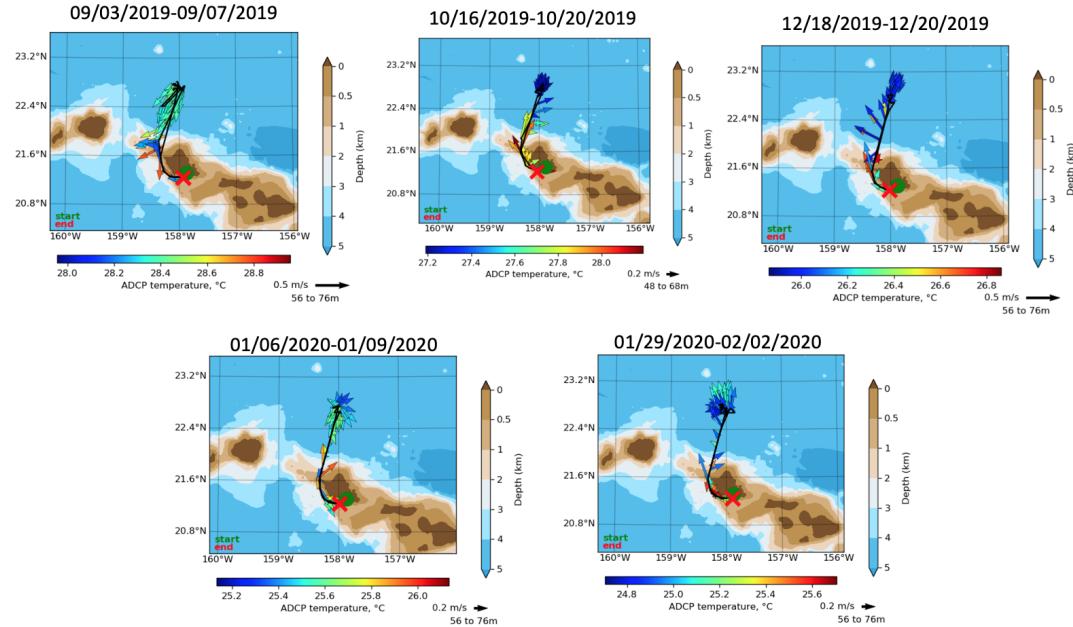


Figure 2.4: Direction and speed of currents near Oah'u during the time period of goatfish collection. Maps and data provided by HOT cruises conducted by SOEST UH (SOEST UH 2021).

The military/airport site grouping was expected to have the highest PFAS concentrations because of AFFF storage and firefighting practices. The reference site grouping was suspected to have the lowest concentrations of PFASs because they are located along a remote coastline far away from suspected point sources. Urban and sewage sites were suspected to have intermediate contamination due to urbanization and wastewater runoff into the ocean. Statistically, there were no differences among site groupings for PFUnA or PFOS (Figure 2.5). The military/airport grouping had higher concentrations of 6:2 FTS concentrations compared to the reference

grouping ($p=0.03$) and tended to have higher 6:2 FTS concentrations compared to urban runoff ($p=0.08$). Sewage sites had detectable concentrations of all three PFASs (Figure 2.5). The overall lack of differences among site groupings suggests that there are few point sources that significantly impact the nearshore marine benthic food web of O‘ahu. There was slight evidence for point sources of PFASs from the military/airport sites, since 6:2 FTS was significantly higher at this site grouping than the reference site grouping. Military/airport sites on O‘ahu have known storages and historical releases of AFFF, which is composed of various PFASs (D. Felton personal communication) and can contain 6:2 FTS (Harding et al. 2015).

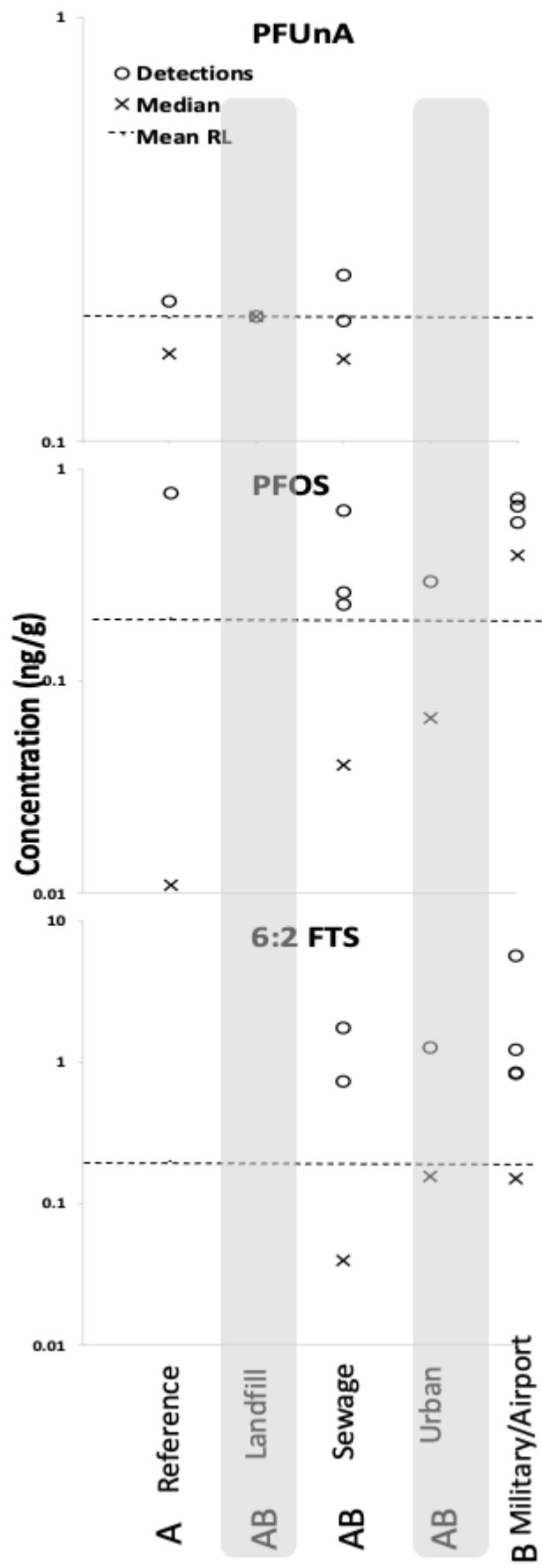


Figure 2.5: A site grouping comparison of detected concentrations of PFUnA, PFOS, and 6:2 FTS (open circles) with site grouping medians calculated from NADA (X) and the average reporting limit across all fish (black dotted lines). Fish samples below the reporting limit are not shown. Site names sharing the same capital letter(s) do not significantly differ in PFOS concentrations. Urban and military/airport grouping were marginally significantly different from reference site groupings for 6:2 FTS ($p=0.08$).

No correlations were found between PFAS concentrations versus capture depth, fork length, total length, or fish mass. The former correlations were investigated to explore the possibility of higher PFAS concentrations nearer to shore in shallower waters than deeper; the data provided no evidence for this. The lack of correlations with fish length or mass supported our conclusions that the reference fish did not have detectable (higher) concentrations than fish from other sites because of size or age. A correlation between liver:body mass and PFOS concentrations was explored to assess the possibility that PFOS could cause enlarged livers in goatfish, as has been seen in other studies (Darrow et al. 2016, Lau et al. 2007). No correlation was observed ($\tau = -0.190$, $p = 0.066$, Table S5 in Appendix A, Figure 2.6). No correlation indicates that the environmental PFOS concentrations in nearshore O‘ahu habitats are not high enough to cause liver enlargement in goatfish.

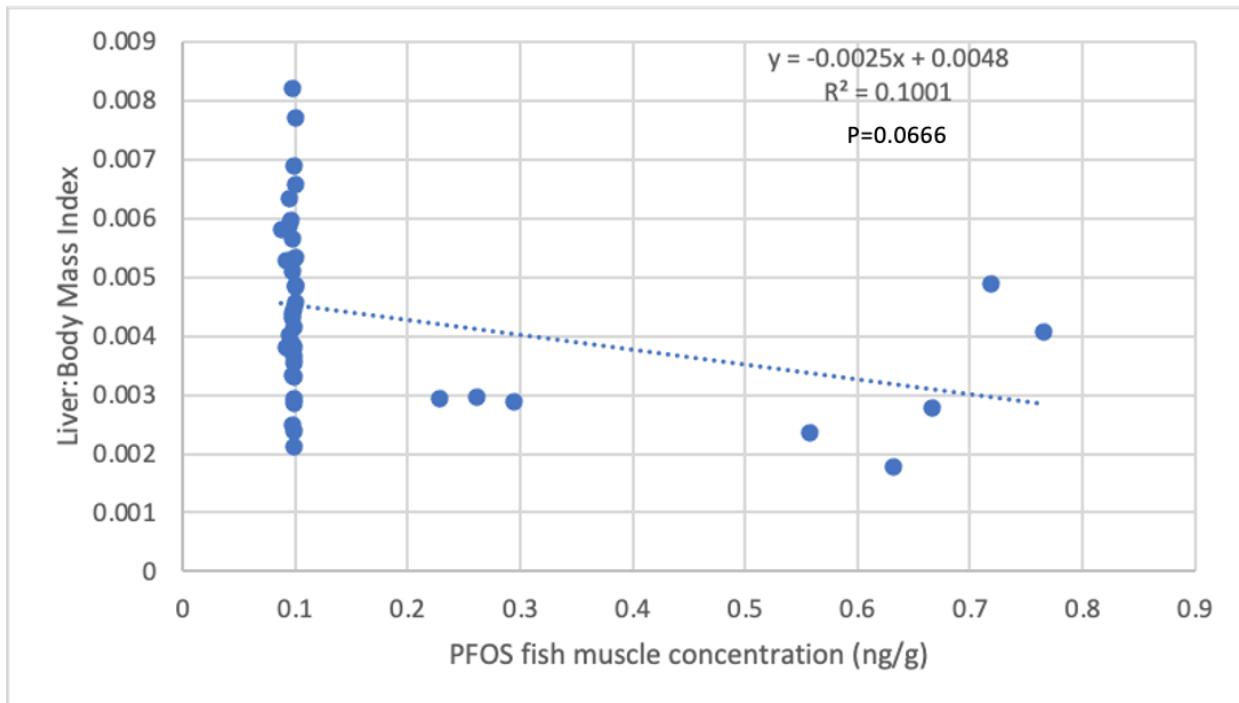


Figure 2.6: Kendall Tau correlation of PFOS in fish muscle compared to liver:body mass ratio. A slightly negative correlation is seen, tau=-0.190 p=0.066. Blue dots indicate values of detectable fish.

The EHDI of PFOS on O‘ahu, if people’s consumption of fish were solely goatfish and they weighed 60 kg, is 0.113 ng/kg/day, which is the lowest estimated daily intake compared to other studies (Squadrone et al. 2014, Squadrone et al. 2015, Fair et al. 2019, Pico et al. 2018; Table 2.2). Using the average US body weight (Vakharia 2016), the EHDI is 0.0823 ng/kg/day . South Carolina intake levels of PFOS from fish consumption are 18 times higher than O‘ahu (Fair et al. 2019). South Carolina intake levels may be higher because the fish were from estuaries which may have a higher input of freshwater or could come from industrial point sources. In Italy, intake levels of PFOS from fish consumption are 45 times higher than O‘ahu (Squadrone et al. 2014, Squadrone et al. 2015). One reason we can see this difference is because the fish from Italy were from freshwater lakes; PFOS contamination may be higher in lakes

because they are a more limited body of water whereas marine environments are globally connected. Additionally it is possible that PFASs are more diluted in marine environments because of the larger volume of water compared to smaller lakes or rivers.

Table 2.2: Table of PFOS human risk assessments for fish consumption

Reference	Year	Location	Risk Reference Value	Average intake determined (ng/kg/day)	Citation for the Risk Reference Value	Above or Below Risk Reference Value
Fair et al	2019	South Carolina	25 ng/kg/day	2.21-6.20 n	16.2 g/day (Two meals per month) and 97.2 g/day (3 meals per week) Fair et al. 2019	Below, no concern
Pico et al	2018	Spain	16.9 ng/kg/day	3.04- 158.8	Not stated	Stated no concern
Squadrone et al	2014	Italy	150 ng/kg/day	11.9-54.39	Leclercq et al. 2009	Below, but still concerning
Squadrone et al	2015	Italy	150 ng/kg/day	5.15-23.55	Leclercq et al. 2009	Below, but still concerning
This study	2019/2020	Hawaii		0.113*	Leclercq et al. 2009	Below both previous standards, no concern

Footnote: *average daily consumption from Baker et al. 2020

Comparing the calculated EHDI of PFOS for O‘ahu the maximum acceptable oral dose, or reference dose values (RfD), defined by other US states, O‘ahu exposure is well below the limits set by Minnesota, Michigan, Wisconsin, and New Jersey, (EPA 2020) (Table 2.3). RfD

values are defined as the maximum acceptable oral dose of a toxic substance to the human population that is likely not contributing to toxic effects during the lifetime (EPA 2020). On O‘ahu the EHDI has been determined at 0.113 ng/kg/day of PFOS consumption, about 15 times lower than New Jersey's RfD, the most cautious RfD reported thus far. O‘ahu’s EHDI is about 700 times lower than the highest RfD value in Oregon. This indicates that people on Oah‘u are likely not experiencing toxicological symptoms.

Table 2.3: US state PFOS RfD values and Max State Advisory Limits (ng of PFOS per gram of fish tissue). Limits are based on a meal size of 8 oz fish fillet and the RfD value.

State	RfD Value	State Max Advisory limit (ng/g)
Alabama	77 ng/kg/day	800
Connecticut	20 ng/kg/day`	159
Indiana	20 ng/kg/day*	200
Maine	20 ng/kg/day`	338.2
Michigan	14 ng/kg/day	300
Minnesota	20 ng/kg/day*	200
New Hampshire	3.0 ng/kg/day	n/a
New Jersey	1.8 ng/kg/day	204
New York	20 ng/kg/day`	200
Oregon	80 ng/kg/day	
Wisconsin	20 ng/kg/day*	200
Great Lake Contorium^	20 ng/kg/day*	200

Footnote: ^ Great Lake Contorium: includes Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin , * indicates part of the GLC, ` indicates it is based upon the USEPA RfD value,

The PFAS concentrations in goatfish can be compared to other marine organisms in the Hawaiian Islands, including albatross from Midway Atoll (Chu et al. 2015), cetaceans from

around O‘ahu (Kurtz et al. 2019), and sea turtles around Hawaii (Woods et al. 2021). Of all of these organisms the goatfish have the lowest concentrations of PFOS, but it is important to note that different tissues were analyzed (Chu et al., Kurtz et al. 2019, Woods et al. 2021) (Figure 2.7). Highest concentrations of PFOS were found in the livers of cetaceans (Kurtz et al. 2019) (Figure 2.7). Livers of cetaceans and albatross had higher concentrations of PFOS compared to other tissues studied from the same organisms (Kurtz et al. 2019, Chu et al. 2015). Cetaceans and albatross are suspected to have higher PFASs concentrations than goatfish because they are higher on the food chain (Chu et al., Kurtz et al. 2019). Green sea turtles at the age sampled are herbivores and had higher levels of PFOS in their plasma than goatfish muscle (Woods et al. 2021). The turtle concentrations may be higher because of PFOS partitioning preferentially in blood vs muscle, or possibly due to maternal offloading into laid eggs. While the comparisons are challenging because of the different tissues analyzed, O‘ahu goatfish had the overall lowest concentration.

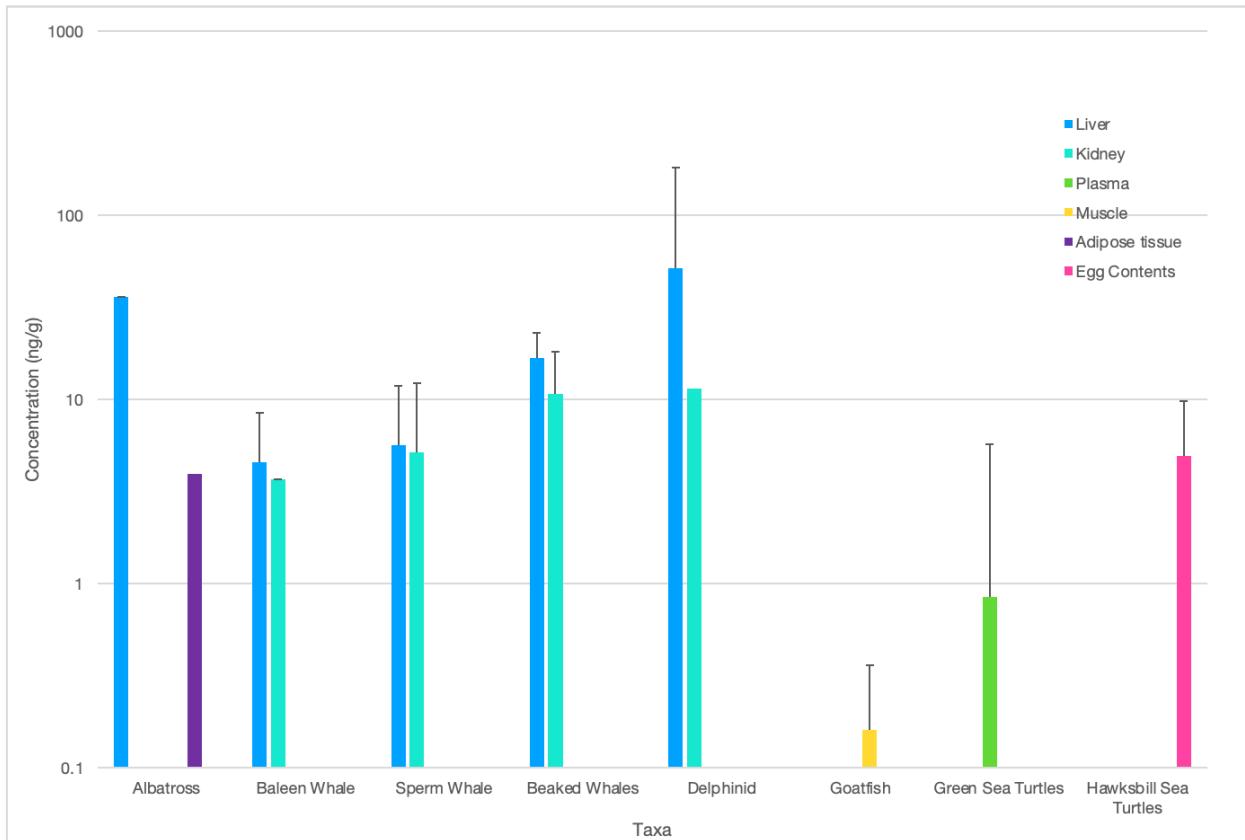


Figure 2.7: Comparison of average PFOS concentrations in tissues of various taxa from Hawaii (Chu et al. 2015, Kurtz et al. 2019, Woods et al. 2021). Albatross liver and adipose tissue from Midway Atoll, cetaceans liver and kidney from around Hawaii, sea turtles plasma and egg contents, and goatfish muscle from O‘ahu. Error bars are standard deviation and are shown only when the publication reported it.

PFASs in goatfish from Hawaii are amongst the lowest ever reported for fish fillets (Cerveny et al. 2015, Delinsky et al. 2009, Shi et al. 2009, Squadrone et al. 2014, Squadrone et al. 2015, Zaho et al. Fair et al. 2019, Peng et al. 2010, Wu et al. 2011, Bhavsar et al. 2014, Goodrow et al 2020, Mazzoni et al. 2020, Pan et al. 2014, Labadie et al. 2011, Ahrens et al. 2016, Ruffle et al. 2020) (Figure 2.8). However, the current study is the first to report 6:2 FTS in any fish fillet. PFUnA was found in Hawaiian goatfish as well as sunfish from North Carolina

and Minnesota (Delinsky et al 2009). PFOS was found in all fish studies, with the lowest in various fish species from Zhejiang China at mean PFOS of 0.063 ng/g and the highest in sunfish from Minnesota at mean PFOS of 272 ng/g (Wu et al. 2011, Delinsky et al. 2009) (Table S1, Figure 2.8).

Freshwater fish appear to have higher concentrations of PFOS compared to saltwater fish (Figure 2.8). Two potential explanations for this are that 1) freshwater fish are in a more confined habitat with longer retention times than marine environments, and 2) freshwater habitats may be closer to major point sources, such as PFAS manufacturing or application facilities. When comparing O‘ahu goatfish to other studies, two areas have lower PFOS concentrations: Zhejiang China and the Yangtze River area in China (Wu et al. 2011, Peng et al 2010). Zhejiang China has a population 5 times greater than O‘ahu, but surprisingly the fish found in this area had lower levels of PFOS. The Yangtze River receives pollution from several sources such as industrial waste and wastewater, which may indicate higher levels of pollution, but concentrations found in the Chinese sturgeon are lower than what has been found in Hawaiian goatfish (Peng et al. 2010). When comparing O‘ahu fish to freshwater fish from the USA, PFOS concentrations were 300 times lower in Hawaii than both Minnesota and North Carolina (Delinsky et al. 2009). When comparing O‘ahu fish to marine fish from the USA, PFOS concentrations are 3 times lower than both Western and Southeastern parts of the USA (Ruffle et al. 2020). This was expected because Hawaii has less potential point sources than the continental United States. Fish from the Tibetan Plateau had PFOS concentrations 10 times higher than fish from O‘ahu (Shi et al. 2009). The Tibetan plateau is expected to be a pristine environment whereas Hawaii has known point sources of PFASs contamination. The reasons for these

surprising comparisons are likely numerous and complex, but likely have to do with atmospheric transport of PFASs or alpine fishes slow growth rate.

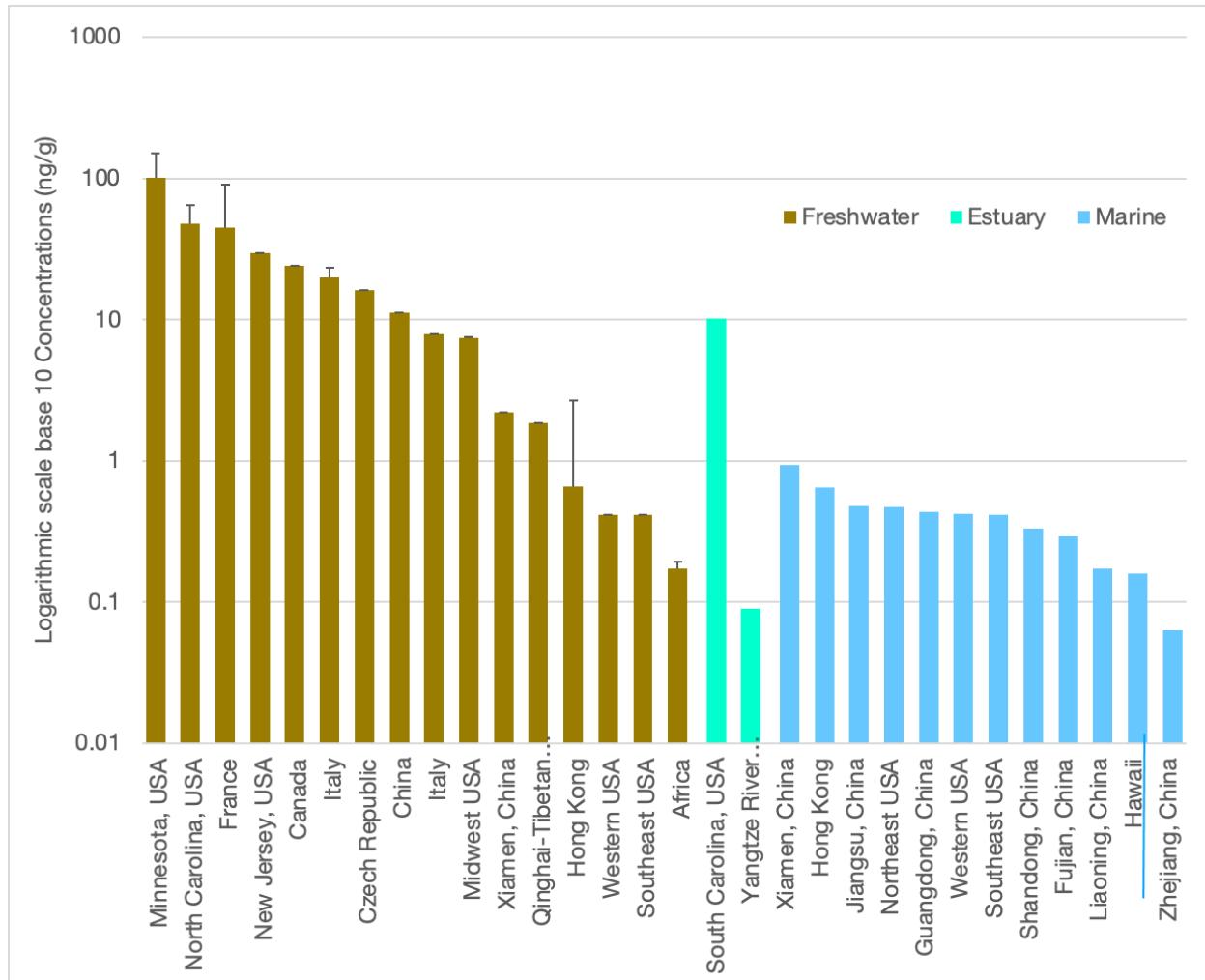


Figure 2.8: Mean PFOS concentrations reported in fish fillets from around the world.

Error bars are standard deviation and are shown only when the publication reported it. Brown indicates freshwater fish, teal indicates estuarine fish, and blue indicates marine fish. The present study is underlined. (Cerveny et al. 2015, Delinsky et al. 2009, Shi et al. 2009, Squadrone et al. 2014, Zaho et al. Fair et al. 2019, Peng et al. 2010, Wu et al. 2011, Bhavsar et al. 2014, Goodrow et al 2020, Mazzoni et al. 2020, Pan et al. 2014, Labadie et al. 2011, Ahrens et al. 2016, Ruffle et al. 2020).

The effects of PFOS on fish include changes in behavior, mating, reproduction, growth, cellular stress, and respiration (Zhang et al. 2011, Spulber et al. 2014, Hagenaars et al. 2014, Han and Fang et al 2010, Bao et al 2019, Bao et al. 2020, Chen et al. 2014, Chen et al. 2016, Dorts et al. 2011, Guo et al. 2014, Jantzen and Annunziatoet al. 2016, Jantzen et al. 2016, Keiter et al. 2012, Kim et al. 2020, Qiu et al. 2018, Shi et al. 2008, Wu et al. 2019, Xia et al. 2013, Yi et al. 2019, Du et al. 2008, Krovel et al. 2008, and Spachmo and Arukwe 2011 Table S6 found in Appendix A). One study found a no observed adverse effect level (NOAEL) for changes in distance moved, number of swimming bouts per minute, latency to startle, and inactivity periods of 0.1 mg/L of PFOS. The NOAEL for total behavioral activity was <0.1 mg/L of PFOS for zebrafish exposed in water with resulting concentrations in fillets of 21,655 ng/g (Spulber et al. 2014). The average concentration of PFOS found in all O‘ahu fish is 0.16 ng/g. This average is more than 100,000 times below the NOAEL, indicating that fish around O‘ahu have negligible risk of toxic effects of PFOS on their behavior.

Conclusions:

Overall, this study determined that it is safe for people to eat goatfish caught around O‘ahu with low to no risk of health effects from PFASs. On average, consuming only goatfish

daily could result in an estimated daily intake of 0.0823 ng/kg/day or 0.113 ng/kg/day of PFOS for humans. Additionally the estimated daily intake of PFOS on O‘ahu is far below that of RfD values for other states. Reference sites were determined to be contaminated with PFASs, possibly coming from the global transport of a baseline level of PFASs via air and ocean currents. Highest concentrations of PFASs in fish were found at both the sewage and military/airport groupings, possibly due to releases into the ocean of AFFF and wastewater. PFOS levels in O‘ahu goatfish are far below NOAELs for fish, indicating that their populations have no to low risk of toxic effects.

Chapter 3: Summary of PFAS in O‘ahu Goatfish and Recommendations for Future Studies

PFAS (perfluoroalkyl and polyfluoroalkyl substances) are a class of synthetic compounds consisting of a long carbon chain that is completely fluorinated. They are produced via electrochemical fluorination (ECF) or telomerization resulting in even and odd numbered chains and even-numbered, straight, long-chains respectively. PFASs have been documented in human blood, urine, and breastmilk (Liew et al. 2018). Negative health effects in humans have been documented in all ages from newborns up through adults, affecting multiple organ systems, reproduction, and development. In newborns, low birth weights, developmental delays, and neurological disorders have been documented (Liew et al. 2018, Anderko et al. 2020). In adults, testicular and genitourinary cancers, kidney cancer, kidney diseases, hyperlipidemia, thyroid diseases, ulcerative colitis, and gestational hypertension have all been documented (Liew et al.

2018, Anderko et al. 2020, Kirk et al. 2018, Stein and Savitz 2011, Hoffman 2010). PFASs exposure in humans is suspected to come from ingestion, either via drinking water or through food consumption, such as fish.

The objectives of this study were to 1.) determine the types and concentrations of PFASs found in goatfish around O‘ahu, 2.) compare PFAS levels in goatfish from different sites around O‘ahu, to fish from other locations, and to known toxicity thresholds, and 3.) prepare an estimate of the daily intake of PFASs by people living on O‘ahu.

Goatfish around Hawaii are relatively uncompromised compared to fish from other countries, having one of the lowest concentrations of PFOS, at a median of 0.0746 ng/g (Cerveny et al. 2015, Delinsky et al. 2009, Shi et al. 2009, Squadrone et al. 2014, Zaho et al. Fair et al. 2019, Peng et al. 2010, Bhavsar et al. 2014, Goodrow et al 2020, Mazzoni et al. 2020, Pan et al. 2014, Labadie et al. 2011, Ahrens et al. 2016, Ruffle et al. 2020). The average goatfish from around O‘ahu has a muscle concentrations of PFOS at 0.16 ng/g, way below established NOAEL levels of 21,655 ng/g, indicating that the fish are unlikely to be experiencing any toxicological symptoms (Zhang et al. 2011, Spulber et al. 2014, Hagenaars et al. 2014, Han and Fang et al 2010, Bao et al 2019, Bao et al. 2020, Chen et al. 2014, Chen et al. 2016, Dorts et al. 2011, Guo et al. 2014, Jantzen and Annunziatoet al. 2016, Jantzen et al. 2016, Keiter et al. 2012, Kim et al. 2020, Qiu et al. 2018, Shi et al. 2008, Wu et al. 2019, Xia et al. 2013, Yi et al. 2019, Du et al. 2008, Vatland et al. 2008, and Spachmo and Arukwe 2011). However, these NOAEL concentrations have been determined using zebrafish, and may vary depending on the fish species and size. The expected human daily average intake of PFOS when consuming goatfish caught around O‘ahu is 0.0823 ng/kg/day or 0.113 ng/kg/day, indicating that you can freely consume fish around O‘ahu without a high risk of PFOS exposure.

It would be interesting to continue to study the O‘ahu goatfish to examine how different PFASs partition to other organs, such as the liver, which were kept for future analysis at the Center for Marine Debris Research (CMDR) at HPU. Further studies of PFASs in goatfish may indicate that livers have higher concentrations due to the partitioning of PFASs. I would suspect that the livers of goatfish to have higher concentrations of PFASs compared to the fillets from this study because of PFASs ability to bind more readily to proteins, such as the β -lipoproteins and the albumin and liver fatty acid-binding protein (L-FAB), and the liver is a protein-rich organ (Lau et al. 2007, Kurtz et al. 2019). This study focused on one inshore species. Future studies should consider potential differences in PFASs concentrations between inshore and offshore fish species. Some studies have shown that there is a difference in where PFASs are located in the ocean and that concentrations vary from inshore to offshore (Yan et al. 2014). Higher concentrations will likely be found in the offshore species, such as yellowfin tuna, since they are highly migratory and higher on the food chain. To accomplish this, a sample size of about 40 tuna are needed, giving us the ability to see if only a few individuals have detectable concentrations of PFASs, or if many fish have PFAS concentrations at low levels.

I would also like to examine the difference between types and concentrations of PFASs found in the water compared to what is found in the fish, first in the fillets and then in the livers. I believe that there will be a difference in the types of PFASs found, with more detections found in the water since there were not many detections in the fish (Cerveny et al. 2015). I also believe that there will be lower concentrations of PFASs found in the water compared to the fish, since PFASs bioaccumulate in the fish.

The reference site was chosen because of its distance from point sources on O‘ahu, and we were surprised to find PFASs in this area. It would be interesting to look at why the reference

site had detectable levels of PFASs. I believe that it could possibly be due to the movement of water around O‘ahu, but additional information is needed to determine where exactly these PFASs come from. One possible way to examine this is to examine the concentrations of PFASs in the water and sediments at varying distances from O‘ahu, nearshore, mid shore, and offshore, to see if there is a difference in the concentrations and types of PFASs present. This would indicate if the PFASs in the water are coming directly from O‘ahu or if they are being brought to the island through other means. Since nearshore currents are erratic, it is possible that these currents are able to transfer PFASs from heavily contaminated areas to remote areas. Benthic fish, such as the goatfish, have a much smaller half life of PFOS, indicating that short nearshore currents may be enough for bioaccumulation to occur (Hassel et al. 2020).

Goatfish gastrointestinal tracts were also kept for further analysis to determine if goatfish are consuming microplastics. PFASs have been found to absorb onto microplastics (Llorca et al. 2018). This may lead to higher levels of PFASs in the fish because the PFASs attached to the plastic may absorb into the fish tissue. All GI tracts from goatfish in this study have been retained and stored at -80 °C at Center for Marine Debris Research (CMDR) at HPU. These fish will provide the perfect opportunity to study microplastic ingestion by a benthic species of fish from many locations around O‘ahu, and determine if microplastic ingestion is a concern for benthic fish in O‘ahu.

Citations:

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Appendix A. Supporting information for Chapter 2

Table S1: Fish comparisons world wide. PFASs concentrations reported in fish fillets from around the world. Blue highlighted cells under body of water indicates fish were collected from a local fish market, so the body of water is not known.

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Table S2: Targeted PFASs in this study: The chemical makeup and the chemical name of each of the 33 PFASs analyzed in goatfish fillets. Analysis took place at AXYS Analytical outside of Hawai'i Pacific University.

Chemical Name	Abbreviation	Chemical Makeup
Perfluorobutanate	PFBA	C4F7O2
Perfluoropentanoate	PPPeA	C5F9O2
Perfluorohexanoate	PFHxA	C6F11O2
Perfluorohexanoate	PFHpA	C7F13O2
Perfluoroctanoate	PFOA	C8F15O2
Perfluorononanoate	PFNA	C9F17O2
Perfluorodecanoate	PFDA	C10F19O2
Perfluorodecanoate	PFUnA	C11F21O2
Perfluorododecanoate	PFDa	C12F23O2
Perfluorotridecanoate	PFTraDA	C13F25O2
Perfluorotetradecanoate	PFTeDA	C13F27O2
Perfluorobutanesulfonate	PFBS	C4F9O3S-
Perfluoropentanesulfonate	PPPeS	C5F11O3S-
Perfluorohexanesulfonate	PFHxS	C6F13O3S-
Perfluorohexanesulfonate	PFHps	C7F15O3S-
Perfluorooctanesulfonate	PFOS	C8F17O3S-
Perfluoronanotesulfonate	PFNS	C9F19O3S-
Perfluorodecanesulfonate	PFDS	C10F21S03-
Perfluorodecanesulfonate	PFDaS	C12F25O3S-
1H, 1H, 2H, 2H-perfluorohexane sulfonate	OR	4:2 FTS
	H4-PFHxS	F(CF2)4CH2CH2SO3H
1H, 1H, 2H, 2H-perfluoroctane sulfonate	6:2 FTS	
	OR	
	H4-PFOS	F(CF2)6CH2CH2SO3H
	8:2 FTS	
	OR	
1H, 1H, 2H, 2H-perfluorodecane sulfonate	H4-PFDeS	F(CF2)8CH2CH2SO3H
Perfluoroctanesulfonamide ^e	PFOSA (POSA)	C8H2F17N02S
N-methylperfluoroctanesulfonamide	N-MeFOSA	C9H4F17N02S
N-methylperfluorooctanesulfonamide	N-EFOSA	C10H6F17N02S
N-Methylperfluoro-1-octanesulfonamidacetic acid	N-MeFOSAA	C11H6F17N04S
N-Ethyperfluoro-1-octanesulfonamidacetic acid	N-EFOSAA	C12H6F17N06S
N-Methylperfluoro-1-octanesulfonamidoethanol	N-MeFOSE	F(CF2)8SO2N(CH3)(CH2)2OH
N-Ethyperfluoro-1-octanesulfonamidoethanol	N-EFOSE	F(CF2)8SO2N(CH2CH3)(CH2)2OH
Hexafluoropropylene oxide dimer acid	HFPo-DA	C3F6O
4,8-dioxa-3-H-perfluorononanoate	ADONA	C7H5F12N04
9-chlorotetradecafluoro-3-oxanonane-1-sulfonate	9Cl-PF3ONS	C8ClF6K04S
11-chlorooctadecafluoro-3-oxaundecane-1-sulfonate	11Cl-PF3OUds	C10ClF20K04S

Table S3: All of the raw data collected for Goatfish (*Parupeneus multifasciatus*) from around O'ahu. B indicates that analyte found in the associated blank and concentration in sample is less than 10X the concentration in the associated blank. J indicates that concentration less than limit of quantification. U indicates not detected at RL. RL indicates the reporting limit of the compound.

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Table S4: Mean, median, and SD of the mean for all O'ahu fish, individual sites, and site groupings

					PFU _{nA}		
Grouping	Site Name	Sample Size	# detected	Median (ng/g)	Mean (ng/g)	SD (ng/g)	
All Oahu	All 14	42	4	0.146	0.15	0.0274	
Reference		9	1	0.161^	0.163^	0.0261^	
	Kaena Point South	3	0	<0.195	<0.195	n/a	
	Kaena Point North	3	0	<0.196	<0.195	n/a	
	Kahuku	3	1	0.0985*	0.136*	0.0669*	
Landfill	Waimanalo Gulch Landfill	3	1	0.196^	0.196^	0.000846^	
Sewage		9	2	0.156	0.167	0.0349	
	Kailua Regional Wastewater Treatment Plant	3	0	<0.200	<0.195	n/a	
	Haleiwa	3	2	0.192	0.21	0.036	
	Ahuimanu	3	0	<0.194	<0.195	n/a	
Urban Runoff		12	0	<0.196	<0.195	n/a	
	Hawaii Kai	3	0	<0.195	<0.195	n/a	
	Ewa Beach	3	0	<0.198	<0.195	n/a	
	Ala Wai Harbor	3	0	<0.195	<0.195	n/a	
	Honolulu Harbor	3	0	<0.198	<0.195	n/a	
Military/Airport		9	0	<0.197	<0.195	n/a	
	Bellows	3	0	<0.198	<0.195	n/a	
	Marine Corp Base Hawaii	3	0	<0.198	<0.195	n/a	
	Pearl Harbor	3	0	<0.196	<0.195	n/a	

		PFOS		
Grouping	Site Name	# detected	Median (ng/g)	Mean (ng/g)
All Oahu	All 14	8	0.0746	0.16
Reference		1	0.0109 [^]	0.199 [^]
Kaena Point South		0	<0.195a,b	<0.195
Kaena Point North		1	0.111 [^]	0.417 [^]
Kahuku		0	<0.197a,b	<0.195
Landfill	Waimanalo Gulch Landfill	0	<0.196a,b	<0.195
Sewage		3	0.04	0.153
Kailua Regional Wasterwater Treatment Plant		0	<0.200a,b	<0.195
Haleiwa		0	<0.191a,b	<0.195
Ahuimanu		3	0.262a	0.374
Urban Runoff		1	0.0669 [^]	<0.195 [^]
Hawaii Kai		0	<0.195a,b	<0.195
Ewa Beach		1	0.170a [^]	0.190 [^]
Ala Wai Harbor		0	<0.195b	<0.195
Honolulu Harbor		0	<0.198a,b	<0.195
Military/Airport		3	0.392	0.477
Bellows		0	<0.198a,b	<0.195
Marine Corp Base Hawaii		0	<0.198a,b	<0.195
Pearl Harbor		3	0.667b	0.648

			6:2 FTS		
Grouping	Site Name	# detected	Median (ng/g)	Mean (ng/g)	SD (ng/g)
All Oahu	All 14	7	0.0622	0.353	0.916
Reference		0	<0.706c	<0.703	n/a
	Kaena Point South	0	<0.702	<0.703	n/a
	Kaena Point North	0	<0.706	<0.703	n/a
	Kahuku	0	<0.709	<0.703	n/a
Landfill	Waimanalo Gulch Landfill	0	<0.706	<0.703	n/a
Sewage		2	0.039	0.31	0.585
	Kailua Regional Wasterwater Treatment Plant	1	0.502	0.874	1.25
	Haleiwa	1	0.502	0.685	0.0342
	Ahuimanu	0	<0.699	<0.703	n/a
Urban Runoff		1	0.154^d	0.287^a	0.450^a
	Hawaii Kai	0	<0.702	<0.703	n/a
	Ewa Beach	0	<0.713	<0.703	n/a
	Ala Wai Harbor	0	<0.702	<0.703	n/a
	Honolulu Harbor	1	0.360*	0.662*	0.526*
Military/Airport		4	0.15	0.993	1.78
	Bellows	1	0.577	0.701	0.484
	Marine Corp Base Hawaii	1	0.178*	1.98*	3.12*
	Pearl Harbor	2	0.824	0.819	0.0248

SD indicates one standard deviation. n/a = not available. Values with < sign are the means of the reporting limits (RLs) across the fish. Median values without superscripts indicates that there were no significant differences among sites or site groupings ($p<0.05$). a indicates different from Pearl Harbor $p<0.05$. b indicates different from Ahuimanu $p<0.05$. c indicates different from Military/Airport ($p=0.03$). d indicates marginally different from Military/Airport ($p=0.08$). * indicates Summary statistics were calculated in Excel with non-detects substituted with $0.5*RL$. ^ indicates chose to report MLE summary statistics instead of ROS because ROS SD was zero.

Table S5: Kendal Tau correlation statistics for goatfish fillet PFOS concentrations compared to fish depth, total length, fork length, body mass, and liver:body mass ratio

Driver	tau			p-value		
	PFOS	6:2 FTS	PFUnA	PFOS	6:2 FTS	PFUnA
Fish depth	-0.114	-0.025	0.028	0.273	0.812	0.792
Total length	-0.043	-0.065	-0.084	0.685	0.535	0.418
Fork length	-0.026	-0.028	-0.077	0.813	0.795	0.458
Mass	-0.065	-0.053	-0.078	0.536	0.612	0.452
Liver:body mass	-0.190	-0.088	0.078	0.066*	0.398	0.452

* indicates a marginal significance of p=0.066 for the liver:body mass ratio in a negative direction.

Table S6: NOAEL of PFOS in fish. List of studies that have looked at PFOS toxicity effects in fish. Spulber et al. 2014 compared known levels of PFOS exposure and determined the concentration of PFOS in zebrafish larvae.

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Appendix B. Raw Data



2045 Mills Road West

TEL: (250) 655-5800

Sidney, BC, Canada V8L5X2

TOLL-FREE: 1-888-373-0881

SGS AXYS Client No.: 4066

Client Address: Tetra Tech, Inc. - Pacific Guardian Ctr.
 737 Bishop St., Suite 2340, Mauka Tower
 Honolulu, HI, US, 96813-3201

The SGS AXYS contact for these data is Dale Robinson.

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BATCH SUMMARY

Batch ID:	WG72536	Date:	21-Jul-2020
Analysis Type:	Perfluorinated Organic and FTS	Matrix Type:	Tissue

BATCH MAKEUP

Contract:	4066	Blank:	WG72536-101
Samples:	L33107-1 L33107-2 L33107-3 L33107-4 L33107-5 L33107-6 L33107-7 L33107-8 L33107-9 L33107-10 L33107-11 L33107-12 L33107-13 L33107-14	Site 1 Kailua WWTP FISH # 1 Site 1 Kailua WWTP FISH # 2 Site 1 Kailua WWTP FISH # 3 Site 3 Ewa Beach Fish # 1 Site 3 Ewa Beach Fish # 2 Site 3 Ewa Beach Fish # 3 Site 4 Ala Wai Fish # 1 Site 4 Ala Wai Fish # 2 Site 4 Ala Wai Fish # 3 Site 9 Bellows Fish #1 Site 9 Bellows Fish #2 Site 9 Bellows Fish #3 Site 5 Honolulu Harbor Fish #1 Site 5 Honolulu Harbor Fish #2	Reference or Spike: WG72536-102 WG72536-103
			Duplicate:

Comments:

1. Data are considered final.
2. The analyte PFOS was detected in the Lab Blank (SGS AXYS ID: WG72536-101). Data are not blank corrected. Blank data should be taken into consideration when evaluating sample data.
3. Blank data should be evaluated against specifications using the same blank sample size as the size of the client samples.
4. Percent recovery of analyte N-MeFOSE and ADONA in the OPR (SGS AXYS ID: WG72536-102) were above the method nominal limit and were flagged with an 'N'. Sample data may be similarly affected.
5. Percent recovery of several labeled compounds in several client samples were outside the method nominal limit and were flagged with a 'V'. As the isotope dilution method of quantification produces data that are recovery corrected, the variances from the method acceptance criteria are deemed not to affect the quantification of the analytes. Percent labeled compound recoveries are used as a general method performance indicator only.

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February 2017



CHAIN OF CUSTODY

2045 Mills Road West TEL: (250) 655-5800 TOLL FREE 1-888-373-0881
 Sidney, British Columbia, Canada V8L 5X2 FAX: (250) 655-5811

SGS AXYS CLIENT #: 4066

REPORT TO:

Company Address		TO: Company Address		INVOICE		ANALYSIS REQUESTED	
Hawaii Pacific University	41-202 Kālamianole Hwy, Ste 9	Tera Tech, Inc. Honolulu	737 Bishop St., Suite 2340				
Waimanalo, HI 96795		Pacific Guardian Center, Mauka Tower	Honolulu, HI 96813-3201				
Contact	Jennifer Lynch	Contact	Eric Jensen				
Phone	808-236-3582 or 843-442-2188	Phone	808-441-4784				
FAX		FAX	808-536-3953				
E-mail	Jlynch@hpu.edu	E-mail	eric.jensen@tetratech.com				
Project Name/Number:	Perfluoroalkyl substance (PFAS) concentrations in fillets of nearshore Hawaiian reef fish caught in subsistence fisheries (HI DOH HPU)	Sampler's Name:	Natasha Sawickij				
Client Sample Identification	Sampling Date	Sampling Time	Container Type/No.	SGS AXYS Lab Sample ID (Lab use only)	MLA-110 (UPLC-MS/MS)		
Site 1 Kailua WWTP Fish #1	Matrix	Nov 3 2019	9:20 AM	50 mL PP tube	L33107-1	Fish Tissue samples	
Site 1 Kailua WWTP Fish #2	Homogenized fish muscle	Nov 3 2019	9:38 AM	50 mL PP tube	-2	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 1 Kailua WWTP Fish #3	Homogenized fish muscle	Nov 3 2019	11:25 AM	50 mL PP tube	-3	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 3 Ewa Beach Fish # 1	Homogenized fish muscle	Dec 15 2019	morning	50 mL PP tube	-4	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 3 Ewa Beach Fish # 2	Homogenized fish muscle	Feb 22 2020	morning	50 mL PP tube	-5	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 3 Ewa Beach Fish # 3	Homogenized fish muscle	Mar 21 2020	11:25 AM	50 mL PP tube	-6	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 4 Ala Wai Fish # 1	Homogenized fish muscle	Nov 15 2019	12:28 PM	50 mL PP tube	-7	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 4 Ala Wai Fish # 2	Homogenized fish muscle	Nov 15 2019	12:37 PM	50 mL PP tube	-8	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 4 Ala Wai Fish # 3	Homogenized fish muscle	Nov 15 2019	12:44 PM	50 mL PP tube	-9	MLA-110 (UPLC-MS/MS)	Fish Tissue samples

Received by: Jennifer Lynch

20 May 2020

10:35

Site 9 Bellows Fish #1	Homogenized fish muscle	Feb 23 2020	11:30 AM	50 mL PP tube	L33107-10	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 9 Bellows Fish #2	Homogenized fish muscle	Feb 23 2020	11:30 AM	50 mL PP tube	-11	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 9 Bellows Fish #3	Homogenized fish muscle	Mar 22 2020	Morning	50 mL PP tube	-12	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 5 Honolulu Harbor Fish #1	Homogenized fish muscle	Nov 15 2019	2:35 PM	50 mL PP tube	-13	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 5 Honolulu Harbor Fish #2	Homogenized fish muscle	Nov 15 2019	2:40PM	50 mL PP tube	-14	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 5 Honolulu Harbor Fish #3	Homogenized fish muscle	Dec 15 2019	2:40PM	50 mL PP tube	-15	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 7 Pearl Harbor Fish #1	Homogenized fish muscle	Feb 22 2020	1:30 PM	50 mL PP tube	-16	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 7 Pearl Harbor Fish #2	Homogenized fish muscle	Feb 22 2020	1:30 PM	50 mL PP tube	-17	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 7 Pearl Harbor Fish #3	Homogenized fish muscle	Feb 22 2020	2:00 PM	50 mL PP tube	-18	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 6 Ahuimanu Fish #1	Homogenized fish muscle	Mar 12 2020	10:45 AM	50 mL PP tube	-19	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 6 Ahuimanu Fish #2	Homogenized fish muscle	Mar 12 2020	10:55 AM	50 mL PP tube	-20	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 6 Ahuimanu Fish #3	Homogenized fish muscle	Apr 11 2020	10:15 AM	50 mL PP tube	-21	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 10 K South Fish #1	Homogenized fish muscle	Mar 3 2020	2:10 PM	50 mL PP tube	-22	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 10 K South Fish #2	Homogenized fish muscle	Mar 3 2020	2:15 PM	50 mL PP tube	-23	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 10 K South Fish #3	Homogenized fish muscle	Mar 3 2020	2:20 PM	50 mL PP tube	-24	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 8 Hawaii Kai Fish #1	Homogenized fish muscle	Apr 13 2020	9:00 PM	50 mL PP tube	-25	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 8 Hawaii Kai Fish #2	Homogenized fish muscle	Apr 13 2020	9:00 PM	50 mL PP tube	-26	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 8 Hawaii Kai Fish #3	Homogenized fish muscle	Apr 13 2020	9:00 PM	50 mL PP tube	-27	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 12 Marine Corps Far Fish #1	Homogenized fish muscle	Mar 12 2020	12:50 PM	50 mL PP tube	-28	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 12 Marine Corps Far Fish #2	Homogenized fish muscle	Apr 11 2020	9:20 AM	50 mL PP tube	-29	MLA-110 (UPLC-MS/MS) Fish Tissue samples

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Site 12 Marine Corps Far Fish #3	Homogenized fish muscle	Apr 11 2020	9:30 AM	50 mL PP tube	L 33107 - 30	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 11 Landfill Fish #1	Homogenized fish muscle	Mar 3 2020	4:25 PM	50 mL PP tube	- 31	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 11 Landfill Fish #2	Homogenized fish muscle	Apr 29 2020	1:00 PM	50 mL PP tube	- 32	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 11 Landfill Fish #3	Homogenized fish muscle	Apr 29 2020	12:10 PM	50 mL PP tube	- 33	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 13 K North Fish #1	Homogenized fish muscle	May 7 2020	10:40 AM	50 mL PP tube	- 34	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 13 K North Fish #2	Homogenized fish muscle	May 7 2020	10:50 AM	50 mL PP tube	- 35	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 13 K North Fish #3	Homogenized fish muscle	May 7 2020	10:40 AM	50 mL PP tube	- 36	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 14 Kahuku Fish #1	Homogenized fish muscle	May 13 2020	11:07 AM	50 mL PP tube	- 37	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 14 Kahuku Fish #2	Homogenized fish muscle	May 13 2020	12:15 PM	50 mL PP tube	- 38	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 14 Kahuku Fish #3	Homogenized fish muscle	May 13 2020	10:45 AM	50 mL PP tube	- 39	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 15 Haleiwa Fish #1	Homogenized fish muscle	May 7 2020	1:50 PM	50 mL PP tube	- 40	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 15 Haleiwa Fish #2	Homogenized fish muscle	May 7 2020	1:55 PM	50 mL PP tube	- 41	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 15 Haleiwa Fish #3	Homogenized fish muscle	May 7 2020	2:00 PM	50 mL PP tube	- 42	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Fish Field Blank 1	Deionized water	Apr 29 2020	morning	50 mL PP tube	L 33105 - 1	MLA-110 (UPLC-MS/MS) Water samples
Fish Field Blank 2	Deionized water	May 7 2020	morning	50 mL PP tube	- 2	MLA-110 (UPLC-MS/MS) Water samples
Fish Field Blank 3	Deionized water	May 13 2020	11:27 AM	50 mL PP tube	- 3	MLA-110 (UPLC-MS/MS) Water samples
Relinquished by (Signature) <i>Jennifer Lynch</i>	Date <u>May 13-2020</u> Time <u>10:35</u>	Received by (Signature) <u>Tonya Andersen</u>	Courier <u>FedEx</u>	Sample Receipt	Wavbill No. <u>see email</u>	
Remarks	Date	Time			Temp °C	Cooler
					Custody Seal #	

SGS AXYS METHOD MLA-110 Rev 02

Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 1 Kailua WWTP FISH # 1
Sample Collection:
03-Nov-2019 09:20

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-1		
Matrix:	TISSUE	Sample Size:	2.06 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 12:01:21	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 74
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.777 (L)	
PFPeA	U		0.388 (L)	
PFHxA	U		0.194 (L)	
PFHpA	U		0.194 (L)	
PFOA	U		0.194 (L)	
PFNA	U		0.194 (L)	
PFDA	U		0.194 (L)	
PFUnA	U		0.194 (L)	
PFDoA	U		0.194 (L)	
PFTrDA	U		0.194 (L)	
PFTeDA	U		0.194 (L)	
PFBS	U		0.194 (L)	
PFPeS	U		0.194 (L)	
PFHxS	U		0.194 (L)	
PFHpS	U		0.194 (L)	
PFOS	U		0.194 (L)	
PFNS	U		0.194 (L)	
PFDS	U		0.194 (L)	
PFDoS	U H		0.194 (L)	
4:2 FTS	U		0.777 (L)	
6:2 FTS		1.75	0.699 (L)	5:54
8:2 FTS	U		0.777 (L)	
PFOSA	U		0.194 (L)	
N-MeFOSA	U		0.223 (L)	
N-EtFOSA	U		0.485 (L)	
MeFOSAA	U		0.194 (L)	
EtFOSAA	U		0.194 (L)	
N-MeFOSE	U H		1.94 (L)	
N-EtFOSE	U		1.46 (L)	
HFPO-DA	U		0.738 (L)	
ADONA	U		0.777 (L)	
9CI-PF3ONS	U		0.777 (L)	
11CI-PF3OUDS	U		0.777 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 1 Kailua WWTP FISH # 1
Sample Collection:
03-Nov-2019 09:20

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-1
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 12:01:21	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 74
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	38.8	96.9	1:50
13C5-PFPeA		20.0	21.8	109	4:25
13C5-PFHxA		10.0	10.6	106	5:01
13C4-PFHxA		10.0	9.92	99.2	5:28
13C8-PFOA		10.0	9.89	98.9	6:12
13C9-PFNA		5.00	4.77	95.5	7:03
13C6-PFDA		5.00	5.25	105	7:33
13C7-PFUuA		5.00	5.33	107	7:53
13C2-PFDuA		5.00	4.93	98.7	8:09
13C2-PFTeDA		5.00	3.94	78.7	8:51
13C3-PFBS		10.0	10.4	104	4:58
13C3-PFHxA		10.0	9.70	97.0	6:18
13C8-PFOS		10.0	10.9	109	7:39
13C2-4:2 FTS		20.0	26.6	133	4:54
13C2-6:2 FTS		20.0	16.2	81.2	5:54
13C2-8:2 FTS		20.0	21.5	107	7:23
13C8-PFOSA		10.0	12.6	126	8:44
D3-N-MeFOSA		10.0	4.99	49.9	10:10
D5-N-EtFOSA		10.0	7.97	79.7	10:27
D3-MeFOSAA		20.0	26.0	130	7:36
D5-EtFOSAA		20.0	28.9	144	7:45
d7-NMe-FOSE		100	6.92	6.92	10:01
d9-NEt-FOSE		100	39.8	39.8	10:19
13C3-HFPO-DA		40.0	37.2	93.0	5:10

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 11:40:36; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-1_Form2_FC0L_193S74_SJ2755744.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**

CLIENT SAMPLE NO.
Site 1 Kailua WWTP FISH # 2
Sample Collection:
03-Nov-2019 09:38

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-2		
Matrix:	TISSUE	Sample Size:	2.00 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 12:14:26	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 75
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.800 (L)	
PFPeA	U		0.400 (L)	
PFHxA	U		0.200 (L)	
PFHpA	U		0.200 (L)	
PFOA	U		0.200 (L)	
PFNA	U		0.200 (L)	
PFDA	U		0.200 (L)	
PFUnA	U		0.200 (L)	
PFDoA	U		0.200 (L)	
PFTrDA	U		0.200 (L)	
PFTeDA	U		0.200 (L)	
PFBS	U		0.200 (L)	
PFPeS	U		0.200 (L)	
PFHxS	U		0.200 (L)	
PFHpS	U		0.200 (L)	
PFOS	U		0.200 (L)	
PFNS	U		0.200 (L)	
PFDS	U		0.200 (L)	
PFDoS	U H		0.200 (L)	
4:2 FTS	U		0.800 (L)	
6:2 FTS	U		0.720 (L)	
8:2 FTS	U		0.800 (L)	
PFOSA	U		0.200 (L)	
N-MeFOSA	U		0.230 (L)	
N-EtFOSA	U		0.500 (L)	
MeFOSAA	U		0.200 (L)	
EtFOSAA	U		0.200 (L)	
N-MeFOSE	U H		2.00 (L)	
N-EtFOSE	U		1.50 (L)	
HFPO-DA	U		0.760 (L)	
ADONA	U		0.800 (L)	
9CI-PF3ONS	U		0.800 (L)	
11CI-PF3OUDS	U		0.800 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 1 Kailua WWTP FISH # 2
Sample Collection:
03-Nov-2019 09:38

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-2
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 12:14:26	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 75
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	37.6	94.0	1:51
13C5-PFPeA		20.0	20.8	104	4:25
13C5-PFHxA		10.0	10.0	100	5:01
13C4-PFHxA		10.0	10.1	101	5:28
13C8-PFOA		10.0	9.45	94.5	6:12
13C9-PFNA		5.00	4.71	94.2	7:03
13C6-PFDA		5.00	5.13	103	7:33
13C7-PFUuA		5.00	4.76	95.2	7:53
13C2-PFDuA		5.00	4.42	88.5	8:08
13C2-PFTeDA		5.00	3.66	73.2	8:50
13C3-PFBS		10.0	10.4	104	4:58
13C3-PFHxA		10.0	9.62	96.2	6:18
13C8-PFOS		10.0	10.4	104	7:38
13C2-4:2 FTS		20.0	28.9	145	4:54
13C2-6:2 FTS		20.0	17.3	86.5	5:54
13C2-8:2 FTS		20.0	20.6	103	7:23
13C8-PFOSA		10.0	12.9	129	8:44
D3-N-MeFOSA		10.0	6.33	63.3	10:09
D5-N-EtFOSA		10.0	7.95	79.5	10:27
D3-MeFOSAA		20.0	24.2	121	7:36
D5-EtFOSAA		20.0	27.3	137	7:44
d7-NMe-FOSE		100	7.23	7.23	10:01
d9-NEt-FOSE		100	88.1	88.1	10:19
13C3-HFPO-DA		40.0	36.1	90.2	5:10

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

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Report Filename: PFC_FC_LC_PFAS_L33107-2_Form2_FC0L_193S75_SJ2755745.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 1 Kailua WWTP FISH # 3
Sample Collection:
03-Nov-2019 11:25

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-3		
Matrix:	TISSUE	Sample Size:	2.00 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 12:27:24	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 76
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.800 (L)	
PFPeA	U		0.400 (L)	
PFHxA	U		0.200 (L)	
PFHpA	U		0.200 (L)	
PFOA	U		0.200 (L)	
PFNA	U		0.200 (L)	
PFDA	U		0.200 (L)	
PFUnA	U		0.200 (L)	
PFDoA	U		0.200 (L)	
PFTrDA	U		0.200 (L)	
PFTeDA	U		0.200 (L)	
PFBS	U		0.200 (L)	
PFPeS	U		0.200 (L)	
PFHxS	U		0.200 (L)	
PFHpS	U		0.200 (L)	
PFOS	U		0.200 (L)	
PFNS	U		0.200 (L)	
PFDS	U		0.200 (L)	
PFDoS	U H		0.200 (L)	
4:2 FTS	U		0.800 (L)	
6:2 FTS	U		0.720 (L)	
8:2 FTS	U		0.800 (L)	
PFOSA	U		0.200 (L)	
N-MeFOSA	U		0.230 (L)	
N-EtFOSA	U		0.500 (L)	
MeFOSAA	U		0.200 (L)	
EtFOSAA	U		0.200 (L)	
N-MeFOSE	U H		2.00 (L)	
N-EtFOSE	U		1.50 (L)	
HFPO-DA	U		0.760 (L)	
ADONA	U		0.800 (L)	
9CI-PF3ONS	U		0.800 (L)	
11CI-PF3OUDs	U		0.800 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 1 Kailua WWTP FISH # 3
Sample Collection:
03-Nov-2019 11:25

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-3
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 12:27:24	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 76
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	38.0	95.0	1:51
13C5-PFPeA		20.0	21.7	108	4:25
13C5-PFHxA		10.0	10.2	102	5:01
13C4-PFHxA		10.0	10.2	102	5:28
13C8-PFOA		10.0	9.46	94.6	6:12
13C9-PFNA		5.00	4.71	94.3	7:03
13C6-PFDA		5.00	5.57	111	7:33
13C7-PFUuA		5.00	5.39	108	7:52
13C2-PFDuA		5.00	4.83	96.5	8:08
13C2-PFTeDA		5.00	3.74	74.8	8:50
13C3-PFBS		10.0	10.1	101	4:58
13C3-PFHxA		10.0	9.68	96.8	6:18
13C8-PFOS		10.0	10.4	104	7:38
13C2-4:2 FTS		20.0	28.0	140	4:54
13C2-6:2 FTS		20.0	16.2	81.0	5:54
13C2-8:2 FTS		20.0	21.0	105	7:23
13C8-PFOSA		10.0	12.8	128	8:44
D3-N-MeFOSA		10.0	6.21	62.1	10:09
D5-N-EtFOSA		10.0	6.80	68.0	10:27
D3-MeFOSAA		20.0	24.1	121	7:36
D5-EtFOSAA		20.0	24.0	120	7:44
d7-NMe-FOSE		100	6.55	6.55	10:01
d9-NEt-FOSE		100	83.3	83.3	10:19
13C3-HFPO-DA		40.0	38.5	96.1	5:10

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 11:40:36; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-3_Form2_FC0L_193S76_SJ2755746.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 3 Ewa Beach Fish # 1
Sample Collection:
22-Feb-2020

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 12:40:21	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FCOL_193 S: 77
Injection Volume (uL):	2	Blank Data Filename:	FCOL_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FCOL_193 S: 68
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.800 (L)	
PPPeA	U		0.400 (L)	
PFHxA	U		0.200 (L)	
PFHpA	U		0.200 (L)	
PFOA	U		0.200 (L)	
PFNA	U		0.200 (L)	
PFDA	U		0.200 (L)	
PFUnA	U		0.200 (L)	
PFDoA	U		0.200 (L)	
PFTrDA	U		0.200 (L)	
PFTeDA	U		0.200 (L)	
PFBS	U		0.200 (L)	
PPPeS	U		0.200 (L)	
PFHxS	U		0.200 (L)	
PFHpS	U		0.200 (L)	
PFOS	B J	0.294	0.200 (L)	
PFNS	U		0.200 (L)	
PFDS	U		0.200 (L)	
PFDoS	U H		0.200 (L)	
4:2 FTS	U		0.800 (L)	
6:2 FTS	U		0.720 (L)	
8:2 FTS	U		0.800 (L)	
PFOSA	U		0.200 (L)	
N-MeFOSA	U		0.230 (L)	
N-EtFOSA	U		0.500 (L)	
MeFOSAA	U		0.200 (L)	
EtFOSAA	U		0.200 (L)	
N-MeFOSE	U H		2.00 (L)	
N-EtFOSE	U		1.50 (L)	
HFPO-DA	U		0.760 (L)	
ADONA	U		0.800 (L)	
9CI-PF3ONS	U		0.800 (L)	
11CI-PF3OuDs	U		0.800 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; B = analyte found in the associated blank and concentration in sample is less than 10X the concentration in the associated blank; J = concentration less than limit of quantification; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 3 Ewa Beach Fish # 1
Sample Collection:
22-Feb-2020

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-4
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 12:40:21	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 77
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	36.1	90.1	1:51
13C5-PFPeA		20.0	23.2	116	4:25
13C5-PFHxA		10.0	10.1	101	5:01
13C4-PFHxA		10.0	9.31	93.1	5:28
13C8-PFOA		10.0	8.72	87.2	6:12
13C9-PFNA		5.00	4.55	91.0	7:03
13C6-PFDA		5.00	4.86	97.2	7:33
13C7-PFUuA		5.00	4.94	98.8	7:53
13C2-PFDuA		5.00	4.57	91.3	8:08
13C2-PFTeDA		5.00	3.73	74.7	8:50
13C3-PFBS		10.0	9.02	90.2	4:58
13C3-PFHxA		10.0	9.26	92.6	6:18
13C8-PFOS		10.0	10.2	102	7:39
13C2-4:2 FTS		20.0	28.8	144	4:54
13C2-6:2 FTS		20.0	19.3	96.7	5:54
13C2-8:2 FTS		20.0	23.5	117	7:23
13C8-PFOSA		10.0	12.4	124	8:44
D3-N-MeFOSA		10.0	4.80	48.0	10:09
D5-N-EtFOSA		10.0	5.98	59.8	10:27
D3-MeFOSAA		20.0	26.1	131	7:36
D5-EtFOSAA		20.0	26.6	133	7:44
d7-NMe-FOSE		100	28.6	28.6	10:01
d9-NEt-FOSE		100	77.6	77.6	10:19
13C3-HFPO-DA		40.0	33.7	84.2	5:10

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 11:40:36; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-4_Form2_FC0L_193S77_SJ2755747.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 3 Ewa Beach Fish # 2
Sample Collection:
21-Mar-2020

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-5		
Matrix:	TISSUE	Sample Size:	2.02 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 12:53:25	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 78
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.792 (L)	
PFPeA	U		0.396 (L)	
PFHxA	U		0.198 (L)	
PFHpA	U		0.198 (L)	
PFOA	U		0.198 (L)	
PFNA	U		0.198 (L)	
PFDA	U		0.198 (L)	
PFUnA	U		0.198 (L)	
PFDoA	U		0.198 (L)	
PFTrDA	U		0.198 (L)	
PFTeDA	U		0.198 (L)	
PFBS	U		0.198 (L)	
PFPeS	U		0.198 (L)	
PFHxS	U		0.198 (L)	
PFHpS	U		0.198 (L)	
PFOS	U		0.198 (L)	
PFNS	U		0.198 (L)	
PFDS	U		0.198 (L)	
PFDoS	U H		0.198 (L)	
4:2 FTS	U		0.792 (L)	
6:2 FTS	U		0.713 (L)	
8:2 FTS	U		0.792 (L)	
PFOSA	U		0.198 (L)	
N-MeFOSA	U		0.228 (L)	
N-EtFOSA	U		0.495 (L)	
MeFOSAA	U		0.198 (L)	
EtFOSAA	U		0.198 (L)	
N-MeFOSE	U H		1.98 (L)	
N-EtFOSE	U		1.49 (L)	
HFPO-DA	U		0.752 (L)	
ADONA	U		0.792 (L)	
9CI-PF3ONS	U		0.792 (L)	
11CI-PF3OUDS	U		0.792 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 3 Ewa Beach Fish # 2
Sample Collection:
21-Mar-2020

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-5
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 12:53:25	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 78
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	39.0	97.5	1:52
13C5-PFPeA		20.0	29.5	147	4:25
13C5-PFHxA		10.0	10.9	109	5:01
13C4-PFHxA		10.0	9.80	98.0	5:29
13C8-PFOA		10.0	9.77	97.7	6:13
13C9-PFNA		5.00	5.02	100	7:05
13C6-PFDA		5.00	5.54	111	7:34
13C7-PFUuA		5.00	5.24	105	7:54
13C2-PFDuA		5.00	4.62	92.4	8:09
13C2-PFTeDA		5.00	3.21	64.2	8:50
13C3-PFBS		10.0	9.00	90.0	4:59
13C3-PFHxA		10.0	9.92	99.2	6:19
13C8-PFOS		10.0	11.1	111	7:40
13C2-4:2 FTS		20.0	32.1	161	4:54
13C2-6:2 FTS		20.0	22.8	114	5:54
13C2-8:2 FTS		20.0	31.1	156	7:25
13C8-PFOSA		10.0	12.9	129	8:44
D3-N-MeFOSA		10.0	4.89	48.9	10:08
D5-N-EtFOSA		10.0	6.68	66.8	10:25
D3-MeFOSAA		20.0	29.7	148	7:37
D5-EtFOSAA		20.0	34.5	173	7:45
d7-NMe-FOSE		100	7.25	7.25	9:59
d9-NEt-FOSE		100	80.3	80.3	10:18
13C3-HFPO-DA		40.0	47.4	118	5:10

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 11:40:36; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-5_Form2_FC0L_193S78_SJ2755748.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02
**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**
CLIENT SAMPLE NO.
Site 3 Ewa Beach Fish # 3
Sample Collection:
15-Dec-2019 11:25
SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-6		
Matrix:	TISSUE	Sample Size:	2.06 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 13:06:23	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 79
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.777 (L)	
PFPeA	U		0.388 (L)	
PFHxA	U		0.194 (L)	
PFHpA	U		0.194 (L)	
PFOA	U		0.194 (L)	
PFNA	U		0.194 (L)	
PFDA	U		0.194 (L)	
PFUnA	U		0.194 (L)	
PFDoA	U		0.194 (L)	
PFTrDA	U		0.194 (L)	
PFTeDA	U		0.194 (L)	
PFBS	U		0.194 (L)	
PFPeS	U		0.194 (L)	
PFHxS	U		0.194 (L)	
PFHpS	U		0.194 (L)	
PFOS	U		0.194 (L)	
PFNS	U		0.194 (L)	
PFDS	U		0.194 (L)	
PFDoS	U H		0.194 (L)	
4:2 FTS	U		0.777 (L)	
6:2 FTS	U		0.699 (L)	
8:2 FTS	U		0.777 (L)	
PFOSA	U		0.194 (L)	
N-MeFOSA	U		0.223 (L)	
N-EtFOSA	U		0.485 (L)	
MeFOSAA	U		0.194 (L)	
EtFOSAA	U		0.194 (L)	
N-MeFOSE	U H		1.94 (L)	
N-EtFOSE	U		1.46 (L)	
HFPO-DA	U		0.738 (L)	
ADONA	U		0.777 (L)	
9CI-PF3ONS	U		0.777 (L)	
11CI-PF3OUDS	U		0.777 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 3 Ewa Beach Fish # 3
Sample Collection:
15-Dec-2019 11:25

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-6
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 13:06:23	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 79
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	39.3	98.2	1:51
13C5-PFPeA	V	20.0	35.0	175	4:26
13C5-PFHxA		10.0	11.3	113	5:02
13C4-PFHxA		10.0	9.92	99.2	5:29
13C8-PFOA		10.0	9.72	97.2	6:12
13C9-PFNA		5.00	5.12	102	7:02
13C6-PFDA		5.00	5.55	111	7:33
13C7-PFUuA		5.00	5.25	105	7:52
13C2-PFDuA		5.00	4.26	85.2	8:08
13C2-PFTeDA		5.00	3.52	70.3	8:48
13C3-PFBs		10.0	8.34	83.4	4:59
13C3-PFHxA		10.0	10.0	100	6:18
13C8-PFOS		10.0	11.0	110	7:38
13C2-4:2 FTS		20.0	31.3	156	4:54
13C2-6:2 FTS		20.0	18.5	92.6	5:54
13C2-8:2 FTS		20.0	21.2	106	7:23
13C8-PFOSA		10.0	13.5	135	8:42
D3-N-MeFOSA		10.0	5.14	51.4	10:08
D5-N-EtFOSA		10.0	6.95	69.5	10:26
D3-MeFOSAA		20.0	24.2	121	7:36
D5-EtFOSAA		20.0	28.5	142	7:44
d7-NMe-FOSE		100	8.34	8.34	10:00
d9-NEt-FOSE		100	106	106	10:18
13C3-HFPO-DA		40.0	54.6	137	5:10

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 11:40:36; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-6_Form2_FC0L_193S79_SJ2755749.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**

CLIENT SAMPLE NO.
Site 4 Ala Wai Fish # 1
Sample Collection:
15-Nov-2019 12:28

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-7		
Matrix:	TISSUE	Sample Size:	2.01 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 13:19:28	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 80
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.796 (L)	
PFPeA	U		0.398 (L)	
PFHxA	U		0.199 (L)	
PFHpA	U		0.199 (L)	
PFOA	U		0.199 (L)	
PFNA	U		0.199 (L)	
PFDA	U		0.199 (L)	
PFUnA	U		0.199 (L)	
PFDoA	U		0.199 (L)	
PFTrDA	U		0.199 (L)	
PFTeDA	U		0.199 (L)	
PFBS	U		0.199 (L)	
PFPeS	U		0.199 (L)	
PFHxS	U		0.199 (L)	
PFHpS	U		0.199 (L)	
PFOS	U		0.199 (L)	
PFNS	U		0.199 (L)	
PFDS	U		0.199 (L)	
PFDoS	U H		0.199 (L)	
4:2 FTS	U		0.796 (L)	
6:2 FTS	U		0.716 (L)	
8:2 FTS	U		0.796 (L)	
PFOSA	U		0.199 (L)	
N-MeFOSA	U		0.229 (L)	
N-EtFOSA	U		0.498 (L)	
MeFOSAA	U		0.199 (L)	
EtFOSAA	U		0.199 (L)	
N-MeFOSE	U H		1.99 (L)	
N-EtFOSE	U		1.49 (L)	
HFPO-DA	U		0.756 (L)	
ADONA	U		0.796 (L)	
9CI-PF3ONS	U		0.796 (L)	
11CI-PF3OUDS	U		0.796 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 4 Ala Wai Fish # 1
Sample Collection:
15-Nov-2019 12:28

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-7
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 13:19:28	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 80
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	29.3	73.2	1:51
13C5-PFPeA		20.0	20.2	101	4:26
13C5-PFHxA		10.0	8.25	82.5	5:02
13C4-PFHxA		10.0	7.88	78.8	5:29
13C8-PFOA		10.0	7.72	77.2	6:11
13C9-PFNA		5.00	3.79	75.8	7:02
13C6-PFDA		5.00	4.29	85.8	7:33
13C7-PFUuA		5.00	4.19	83.7	7:52
13C2-PFDuA		5.00	3.89	77.9	8:08
13C2-PFTeDA	V	5.00	2.23	44.6	8:49
13C3-PFBS		10.0	6.13	61.3	4:59
13C3-PFHxA		10.0	7.44	74.4	6:17
13C8-PFOS		10.0	8.25	82.5	7:38
13C2-4:2 FTS		20.0	21.2	106	4:55
13C2-6:2 FTS		20.0	13.5	67.5	5:53
13C2-8:2 FTS		20.0	16.7	83.7	7:23
13C8-PFOSA		10.0	9.31	93.1	8:42
D3-N-MeFOSA		10.0	2.70	27.0	10:08
D5-N-EtFOSA		10.0	4.16	41.6	10:26
D3-MeFOSAA		20.0	20.0	100	7:36
D5-EtFOSAA		20.0	21.6	108	7:44
d7-NMe-FOSE		100	54.6	54.6	10:00
d9-NEt-FOSE		100	55.2	55.2	10:18
13C3-HFPO-DA		40.0	33.8	84.5	5:11

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 11:40:36; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-7_Form2_FC0L_193S80_SJ2755750.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**

CLIENT SAMPLE NO.
Site 4 Ala Wai Fish # 2
Sample Collection:
15-Nov-2019 12:37

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-8		
Matrix:	TISSUE	Sample Size:	2.19 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 13:32:25	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 81
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.731 (L)	
PFPeA	U		0.365 (L)	
PFHxA	U		0.183 (L)	
PFHpA	U		0.183 (L)	
PFOA	U		0.183 (L)	
PFNA	U		0.183 (L)	
PFDA	U		0.183 (L)	
PFUnA	U		0.183 (L)	
PFDoA	U		0.183 (L)	
PFTrDA	U		0.183 (L)	
PFTeDA	U		0.183 (L)	
PFBS	U		0.183 (L)	
PFPeS	U		0.183 (L)	
PFHxS	U		0.183 (L)	
PFHpS	U		0.183 (L)	
PFOS	U		0.183 (L)	
PFNS	U		0.183 (L)	
PFDS	U		0.183 (L)	
PFDoS	U H		0.183 (L)	
4:2 FTS	U		0.731 (L)	
6:2 FTS	U		0.658 (L)	
8:2 FTS	U		0.731 (L)	
PFOSA	U		0.183 (L)	
N-MeFOSA	U		0.210 (L)	
N-EtFOSA	U		0.457 (L)	
MeFOSAA	U		0.183 (L)	
EtFOSAA	U		0.183 (L)	
N-MeFOSE	U H		1.83 (L)	
N-EtFOSE	U		1.37 (L)	
HFPO-DA	U		0.694 (L)	
ADONA	U		0.731 (L)	
9CI-PF3ONS	U		0.731 (L)	
11CI-PF3OUDS	U		0.731 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 4 Ala Wai Fish # 2
Sample Collection:
15-Nov-2019 12:37

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-8
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 13:32:25	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 81
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	34.4	86.0	1:50
13C5-PFPeA	V	20.0	30.3	151	4:25
13C5-PFHxA		10.0	9.09	90.9	5:01
13C4-PFHxA		10.0	8.56	85.6	5:29
13C8-PFOA		10.0	8.49	84.9	6:12
13C9-PFNA		5.00	4.26	85.2	7:03
13C6-PFDA		5.00	4.55	90.9	7:33
13C7-PFUuA		5.00	4.43	88.5	7:52
13C2-PFDuA		5.00	4.27	85.4	8:08
13C2-PFTeDA		5.00	3.06	61.1	8:50
13C3-PFBs		10.0	7.10	71.0	4:59
13C3-PFHxA		10.0	8.75	87.5	6:18
13C8-PFOS		10.0	9.67	96.7	7:38
13C2-4:2 FTS		20.0	26.1	130	4:54
13C2-6:2 FTS		20.0	16.8	83.9	5:54
13C2-8:2 FTS		20.0	21.9	110	7:23
13C8-PFOSA		10.0	12.1	121	8:43
D3-N-MeFOSA		10.0	3.96	39.6	10:09
D5-N-EtFOSA		10.0	6.02	60.2	10:26
D3-MeFOSAA		20.0	23.9	120	7:36
D5-EtFOSAA		20.0	25.3	126	7:44
d7-NMe-FOSE		100	20.3	20.3	10:01
d9-NEt-FOSE		100	82.4	82.4	10:19
13C3-HFPO-DA		40.0	52.7	132	5:10

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 11:40:36; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-8_Form2_FC0L_193S81_SJ2755751.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02
**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**
**CLIENT SAMPLE NO.
Site 4 Ala Wai Fish # 3
Sample Collection:
15-Nov-2019 12:44**
SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-9		
Matrix:	TISSUE	Sample Size:	2.05 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 13:45:30	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 82
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.780 (L)	
PFPeA	U		0.390 (L)	
PFHxA	U		0.195 (L)	
PFHpA	U		0.195 (L)	
PFOA	U		0.195 (L)	
PFNA	U		0.195 (L)	
PFDA	U		0.195 (L)	
PFUnA	U		0.195 (L)	
PFDoA	U		0.195 (L)	
PFTrDA	U		0.195 (L)	
PFTeDA	U		0.195 (L)	
PFBS	U		0.195 (L)	
PFPeS	U		0.195 (L)	
PFHxS	U		0.195 (L)	
PFHpS	U		0.195 (L)	
PFOS	U		0.195 (L)	
PFNS	U		0.195 (L)	
PFDS	U		0.195 (L)	
PFDoS	U H		0.195 (L)	
4:2 FTS	U		0.780 (L)	
6:2 FTS	U		0.702 (L)	
8:2 FTS	U		0.780 (L)	
PFOSA	U		0.195 (L)	
N-MeFOSA	U		0.224 (L)	
N-EtFOSA	U		0.488 (L)	
MeFOSAA	U		0.195 (L)	
EtFOSAA	U		0.195 (L)	
N-MeFOSE	U H		1.95 (L)	
N-EtFOSE	U		1.46 (L)	
HFPO-DA	U		0.741 (L)	
ADONA	U		0.780 (L)	
9CI-PF3ONS	U		0.780 (L)	
11CI-PF3OUDS	U		0.780 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 4 Ala Wai Fish # 3
Sample Collection:
15-Nov-2019 12:44

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-9
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 13:45:30	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 82
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	35.6	89.0	1:51
13C5-PFPeA		20.0	25.4	127	4:25
13C5-PFHxA		10.0	9.96	99.6	5:01
13C4-PFHxA		10.0	9.72	97.2	5:29
13C8-PFOA		10.0	9.06	90.6	6:12
13C9-PFNA		5.00	4.63	92.7	7:03
13C6-PFDA		5.00	5.16	103	7:33
13C7-PFUuA		5.00	4.91	98.3	7:53
13C2-PFDuA		5.00	4.66	93.2	8:08
13C2-PFTeDA		5.00	3.92	78.3	8:49
13C3-PFBS		10.0	8.12	81.2	4:59
13C3-PFHxA		10.0	9.12	91.2	6:19
13C8-PFOS		10.0	9.68	96.8	7:39
13C2-4:2 FTS		20.0	26.4	132	4:54
13C2-6:2 FTS		20.0	17.6	87.9	5:54
13C2-8:2 FTS		20.0	22.3	111	7:23
13C8-PFOSA		10.0	12.5	125	8:43
D3-N-MeFOSA		10.0	4.99	49.9	10:09
D5-N-EtFOSA		10.0	7.44	74.4	10:26
D3-MeFOSAA		20.0	25.1	126	7:36
D5-EtFOSAA		20.0	26.3	131	7:44
d7-NMe-FOSE		100	19.8	19.8	10:01
d9-NEt-FOSE		100	83.5	83.5	10:18
13C3-HFPO-DA		40.0	43.5	109	5:10

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 11:40:36; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-9_Form2_FC0L_193S82_SJ2755752.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02
Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT
CLIENT SAMPLE NO.
Site 9 Bellows Fish #1
Sample Collection:
23-Feb-2020 11:30
SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Matrix:	TISSUE	Project No.:	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 13:58:28	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 83
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.699 (L)	
PFPeA	U		0.349 (L)	
PFHxA	U		0.175 (L)	
PFHpA	U		0.175 (L)	
PFOA	U		0.175 (L)	
PFNA	U		0.175 (L)	
PFDA	U		0.175 (L)	
PFUnA	U		0.175 (L)	
PFDoA	U		0.175 (L)	
PFTrDA	U		0.175 (L)	
PFTeDA	U		0.175 (L)	
PFBS	U		0.175 (L)	
PFPeS	U		0.175 (L)	
PFHxS	U		0.175 (L)	
PFHpS	U		0.175 (L)	
PFOS	U		0.175 (L)	
PFNS	U		0.175 (L)	
PFDS	U		0.175 (L)	
PFDoS	U H		0.175 (L)	
4:2 FTS	U		0.699 (L)	
6:2 FTS	J	1.21	0.629 (L)	5:53
8:2 FTS	U		0.699 (L)	
PFOSA	U		0.175 (L)	
N-MeFOSA	U		0.201 (L)	
N-EtFOSA	U		0.437 (L)	
MeFOSAA	U		0.175 (L)	
EtFOSAA	U		0.175 (L)	
N-MeFOSE	U H		1.75 (L)	
N-EtFOSE	U		1.31 (L)	
HFPO-DA	U		0.664 (L)	
ADONA	U		0.699 (L)	
9CI-PF3ONS	U		0.699 (L)	
11CI-PF3OUdS	U		0.699 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; J = concentration less than limit of quantification; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonso _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 9 Bellows Fish #1
Sample Collection:
23-Feb-2020 11:30

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-10
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 13:58:28	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 83
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	35.6	89.0	1:51
13C5-PFPeA		20.0	28.7	143	4:25
13C5-PFHxA		10.0	9.67	96.7	5:01
13C4-PFHxA		10.0	9.11	91.1	5:29
13C8-PFOA		10.0	8.86	88.6	6:11
13C9-PFNA		5.00	4.54	90.7	7:02
13C6-PFDA		5.00	4.66	93.3	7:33
13C7-PFUuA		5.00	4.67	93.4	7:52
13C2-PFDuA		5.00	4.79	95.8	8:08
13C2-PFTeDA		5.00	3.48	69.6	8:50
13C3-PFBS		10.0	7.07	70.7	4:59
13C3-PFHxA		10.0	9.05	90.5	6:17
13C8-PFOS		10.0	9.79	97.9	7:38
13C2-4:2 FTS		20.0	25.7	128	4:54
13C2-6:2 FTS		20.0	17.3	86.6	5:53
13C2-8:2 FTS		20.0	20.5	103	7:23
13C8-PFOSA		10.0	12.4	124	8:43
D3-N-MeFOSA		10.0	5.06	50.6	10:09
D5-N-EtFOSA		10.0	6.15	61.5	10:26
D3-MeFOSAA		20.0	24.0	120	7:36
D5-EtFOSAA		20.0	26.7	133	7:44
d7-NMe-FOSE		100	6.82	6.82	10:00
d9-NEt-FOSE		100	78.4	78.4	10:19
13C3-HFPO-DA		40.0	48.3	121	5:10

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 11:40:36; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-10_Form2_FC0L_193S83_SJ2755753.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02
**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**
**CLIENT SAMPLE NO.
Site 9 Bellows Fish #2
Sample Collection:
23-Feb-2020 11:30**
SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS
Lab Sample I.D.:	L33107-11
Matrix:	TISSUE
Sample Size:	2.01 g (wet)
Sample Receipt Date:	20-May-2020
Initial Calibration Date:	18-Mar-2020
Extraction Date:	15-Jun-2020
Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 14:11:33
Column ID:	C18
Extract Volume (uL):	4000
Sample Data Filename:	FC0L_193 S: 84
Injection Volume (uL):	2
Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A
Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng/g (wet weight basis)

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.796 (L)	
PFPeA	U		0.398 (L)	
PFHxA	U		0.199 (L)	
PFHpA	U		0.199 (L)	
PFOA	U		0.199 (L)	
PFNA	U		0.199 (L)	
PFDA	U		0.199 (L)	
PFUnA	U		0.199 (L)	
PFDoA	U		0.199 (L)	
PFTrDA	U		0.199 (L)	
PFTeDA	U		0.199 (L)	
PFBS	U		0.199 (L)	
PFPeS	U		0.199 (L)	
PFHxS	U		0.199 (L)	
PFHpS	U		0.199 (L)	
PFOS	U		0.199 (L)	
PFNS	U		0.199 (L)	
PFDS	U		0.199 (L)	
PFDoS	U H		0.199 (L)	
4:2 FTS	U		0.796 (L)	
6:2 FTS	U		0.716 (L)	
8:2 FTS	U		0.796 (L)	
PFOSA	U		0.199 (L)	
N-MeFOSA	U		0.229 (L)	
N-EtFOSA	U		0.498 (L)	
MeFOSAA	U		0.199 (L)	
EtFOSAA	U		0.199 (L)	
N-MeFOSE	U H		1.99 (L)	
N-EtFOSE	U		1.49 (L)	
HFPO-DA	U		0.756 (L)	
ADONA	U		0.796 (L)	
9CI-PF3ONS	U		0.796 (L)	
11CI-PF3OUDS	U		0.796 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 9 Bellows Fish #2
Sample Collection:
23-Feb-2020 11:30

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-11
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 14:11:33	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 84
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	35.7	89.3	1:51
13C5-PFPeA		20.0	27.0	135	4:25
13C5-PFHxA		10.0	9.64	96.4	5:01
13C4-PFHxA		10.0	8.94	89.4	5:27
13C8-PFOA		10.0	8.84	88.4	6:11
13C9-PFNA		5.00	4.40	88.0	7:02
13C6-PFDA		5.00	4.60	92.0	7:33
13C7-PFUuA		5.00	4.62	92.4	7:52
13C2-PFDuA		5.00	4.38	87.7	8:08
13C2-PFTeDA		5.00	3.31	66.2	8:50
13C3-PFBS		10.0	7.56	75.6	4:58
13C3-PFHxA		10.0	9.13	91.3	6:17
13C8-PFOS		10.0	9.97	99.7	7:38
13C2-4:2 FTS		20.0	25.8	129	4:54
13C2-6:2 FTS		20.0	16.9	84.7	5:53
13C2-8:2 FTS		20.0	21.0	105	7:23
13C8-PFOSA		10.0	12.6	126	8:43
D3-N-MeFOSA		10.0	4.61	46.1	10:09
D5-N-EtFOSA		10.0	6.45	64.5	10:26
D3-MeFOSAA		20.0	24.6	123	7:36
D5-EtFOSAA		20.0	25.7	129	7:44
d7-NMe-FOSE		100	10.7	10.7	10:02
d9-NEt-FOSE		100	69.1	69.1	10:19
13C3-HFPO-DA		40.0	47.2	118	5:09

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 11:40:36; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-11_Form2_FC0L_193S84_SJ2755754.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02
**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**
**CLIENT SAMPLE NO.
Site 9 Bellows Fish #3
Sample Collection:
22-Mar-2020**
SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 14:24:31	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 85
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.792 (L)	
PFPeA	U		0.396 (L)	
PFHxA	U		0.198 (L)	
PFHpA	U		0.198 (L)	
PFOA	U		0.198 (L)	
PFNA	U		0.198 (L)	
PFDA	U		0.198 (L)	
PFUnA	U		0.198 (L)	
PFDoA	U		0.198 (L)	
PFTrDA	U		0.198 (L)	
PFTeDA	U		0.198 (L)	
PFBS	U		0.198 (L)	
PFPeS	U		0.198 (L)	
PFHxS	U		0.198 (L)	
PFHpS	U		0.198 (L)	
PFOS	U		0.198 (L)	
PFNS	U		0.198 (L)	
PFDS	U		0.198 (L)	
PFDoS	U H		0.198 (L)	
4:2 FTS	U		0.792 (L)	
6:2 FTS	U		0.713 (L)	
8:2 FTS	U		0.792 (L)	
PFOSA	U		0.198 (L)	
N-MeFOSA	U		0.228 (L)	
N-EtFOSA	U		0.495 (L)	
MeFOSAA	U		0.198 (L)	
EtFOSAA	U		0.198 (L)	
N-MeFOSE	U H		1.98 (L)	
N-EtFOSE	U		1.49 (L)	
HFPO-DA	U		0.752 (L)	
ADONA	U		0.792 (L)	
9CI-PF3ONS	U		0.792 (L)	
11CI-PF3OUDS	U		0.792 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 9 Bellows Fish #3
Sample Collection:
22-Mar-2020

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-12
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 14:24:31	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 85
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	35.5	88.9	1:51
13C5-PFPeA		20.0	27.4	137	4:25
13C5-PFHxA		10.0	9.47	94.7	5:01
13C4-PFHxA		10.0	9.39	93.9	5:29
13C8-PFOA		10.0	8.89	88.9	6:12
13C9-PFNA		5.00	4.39	87.7	7:03
13C6-PFDA		5.00	5.09	102	7:33
13C7-PFUuA		5.00	4.65	93.0	7:52
13C2-PFDuA		5.00	4.43	88.7	8:08
13C2-PFTeDA		5.00	3.75	74.9	8:50
13C3-PFBS		10.0	7.53	75.3	4:59
13C3-PFHxA		10.0	8.90	89.0	6:18
13C8-PFOS		10.0	10.1	101	7:38
13C2-4:2 FTS		20.0	27.2	136	4:54
13C2-6:2 FTS		20.0	16.4	82.0	5:54
13C2-8:2 FTS		20.0	20.3	102	7:23
13C8-PFOSA		10.0	13.1	131	8:43
D3-N-MeFOSA		10.0	5.87	58.7	10:09
D5-N-EtFOSA		10.0	6.94	69.4	10:26
D3-MeFOSAA		20.0	24.6	123	7:36
D5-EtFOSAA		20.0	26.6	133	7:44
d7-NMe-FOSE		100	7.02	7.02	10:00
d9-NEt-FOSE		100	77.3	77.3	10:19
13C3-HFPO-DA		40.0	47.6	119	5:10

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 11:40:36; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-12_Form2_FC0L_193S85_SJ2755755.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**

CLIENT SAMPLE NO.
Site 5 Honolulu Harbor Fish #1
Sample Collection:
15-Nov-2019 14:35

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-13		
Matrix:	TISSUE	Sample Size:	2.00 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 14:37:36	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 86
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.800 (L)	
PFPeA	U		0.400 (L)	
PFHxA	U		0.200 (L)	
PFHpA	U		0.200 (L)	
PFOA	U		0.200 (L)	
PFNA	U		0.200 (L)	
PFDA	U		0.200 (L)	
PFUnA	U		0.200 (L)	
PFDoA	U		0.200 (L)	
PFTrDA	U		0.200 (L)	
PFTeDA	U		0.200 (L)	
PFBS	U		0.200 (L)	
PFPeS	U		0.200 (L)	
PFHxS	U		0.200 (L)	
PFHpS	U		0.200 (L)	
PFOS	U		0.200 (L)	
PFNS	U		0.200 (L)	
PFDS	U		0.200 (L)	
PFDoS	U H		0.200 (L)	
4:2 FTS	U		0.800 (L)	
6:2 FTS	U		0.720 (L)	
8:2 FTS	U		0.800 (L)	
PFOSA	U		0.200 (L)	
N-MeFOSA	U		0.230 (L)	
N-EtFOSA	U		0.500 (L)	
MeFOSAA	U		0.200 (L)	
EtFOSAA	U		0.200 (L)	
N-MeFOSE	U H		2.00 (L)	
N-EtFOSE	U		1.50 (L)	
HFPO-DA	U		0.760 (L)	
ADONA	U		0.800 (L)	
9CI-PF3ONS	U		0.800 (L)	
11CI-PF3OUDS	U		0.800 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 5 Honolulu Harbor Fish #1
Sample Collection:
15-Nov-2019 14:35

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-13
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 14:37:36	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 86
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	35.5	88.8	1:51
13C5-PFPeA	V	20.0	31.2	156	4:25
13C5-PFHxA		10.0	9.60	96.0	5:02
13C4-PFHxA		10.0	9.01	90.1	5:29
13C8-PFOA		10.0	8.91	89.1	6:12
13C9-PFNA		5.00	4.41	88.2	7:03
13C6-PFDA		5.00	5.17	103	7:33
13C7-PFUuA		5.00	4.90	98.1	7:53
13C2-PFDuA		5.00	4.65	93.1	8:08
13C2-PFTeDA		5.00	3.33	66.6	8:49
13C3-PFBS		10.0	7.28	72.8	4:59
13C3-PFHxA		10.0	8.78	87.8	6:18
13C8-PFOS		10.0	9.46	94.6	7:39
13C2-4:2 FTS		20.0	26.4	132	4:54
13C2-6:2 FTS		20.0	17.0	84.9	5:54
13C2-8:2 FTS		20.0	20.7	104	7:23
13C8-PFOSA		10.0	11.9	119	8:43
D3-N-MeFOSA		10.0	4.82	48.2	10:09
D5-N-EtFOSA		10.0	6.75	67.5	10:26
D3-MeFOSAA		20.0	20.2	101	7:36
D5-EtFOSAA		20.0	24.7	124	7:44
d7-NMe-FOSE		100	7.12	7.12	10:00
d9-NEt-FOSE		100	68.3	68.3	10:19
13C3-HFPO-DA		40.0	54.5	136	5:10

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 11:40:36; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-13_Form2_FC0L_193S86_SJ2755756.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 5 Honolulu Harbor Fish #2
Sample Collection:
15-Nov-2019 14:40

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Project No.

HDOH-HPU PFAS

Lab Sample I.D.:

L33107-14

Matrix: TISSUE

Sample Size:

2.18 g (wet)

Sample Receipt Date: 20-May-2020

Initial Calibration Date:

18-Mar-2020

Extraction Date: 15-Jun-2020

Instrument ID:

LCMS/MS

Analysis Date: 17-Jun-2020 **Time:** 14:50:33

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC0L_193 S: 87

Injection Volume (uL): 2

Blank Data Filename:

FC0L_193 S: 73

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC0L_193 S: 68

Concentration Units: ng/g (wet weight basis)

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Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.734 (L)	
PFPeA	U		0.367 (L)	
PFHxA	U		0.183 (L)	
PFHpA	U		0.183 (L)	
PFOA	U		0.183 (L)	
PFNA	U		0.183 (L)	
PFDA	U		0.183 (L)	
PFUnA	U		0.183 (L)	
PFDoA	U		0.183 (L)	
PFTrDA	U		0.183 (L)	
PFTeDA	U		0.183 (L)	
PFBS	U		0.183 (L)	
PFPeS	U		0.183 (L)	
PFHxS	U		0.183 (L)	
PFHpS	U		0.183 (L)	
PFOS	U		0.183 (L)	
PFNS	U		0.183 (L)	
PFDS	U		0.183 (L)	
PFDoS	U H		0.183 (L)	
4:2 FTS	U		0.734 (L)	
6:2 FTS	J	1.27	0.661 (L)	5:56
8:2 FTS	U		0.734 (L)	
PFOSA	U		0.183 (L)	
N-MeFOSA	U		0.211 (L)	
N-EtFOSA	U		0.459 (L)	
MeFOSAA	U		0.183 (L)	
EtFOSAA	U		0.183 (L)	
N-MeFOSE	U H		1.83 (L)	
N-EtFOSE	U		1.38 (L)	
HFPO-DA	U		0.697 (L)	
ADONA	U		0.734 (L)	
9CI-PF3ONS	U		0.734 (L)	
11CI-PF3OUdS	U		0.734 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; J = concentration less than limit of quantification; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonso _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 5 Honolulu Harbor Fish #2
Sample Collection:
15-Nov-2019 14:40

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-14
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 14:50:33	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_193 S: 87
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68
Concentration Units:	ng absolute		

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Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	35.3	88.2	1:51
13C5-PFPeA		20.0	29.8	149	4:26
13C5-PFHxA		10.0	9.57	95.7	5:02
13C4-PFHxA		10.0	8.79	87.9	5:30
13C8-PFOA		10.0	9.12	91.2	6:15
13C9-PFNA		5.00	4.38	87.6	7:01
13C6-PFDA		5.00	4.86	97.2	7:29
13C7-PFUuA		5.00	4.93	98.6	7:49
13C2-PFDuA		5.00	4.72	94.4	8:06
13C2-PFTeDA		5.00	3.62	72.4	8:48
13C3-PFBS		10.0	8.10	81.0	4:59
13C3-PFHxA		10.0	9.22	92.2	6:21
13C8-PFOS		10.0	9.78	97.8	7:36
13C2-4:2 FTS		20.0	30.6	153	4:55
13C2-6:2 FTS		20.0	17.7	88.5	5:56
13C2-8:2 FTS		20.0	27.5	137	7:18
13C8-PFOSA		10.0	12.6	126	8:42
D3-N-MeFOSA		10.0	5.40	54.0	10:09
D5-N-EtFOSA		10.0	7.42	74.2	10:26
D3-MeFOSAA		20.0	24.7	124	7:34
D5-EtFOSAA		20.0	28.6	143	7:41
d7-NMe-FOSE		100	6.79	6.79	10:00
d9-NEt-FOSE		100	91.1	91.1	10:19
13C3-HFPO-DA		40.0	49.4	123	5:11

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 11:40:36; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-14_Form2_FC0L_193S87_SJ2755757.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.

Lab Blank
Sample Collection:
N/A

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Project No.

N/A

Lab Sample I.D.:

WG72536-101

Matrix: TISSUE

Sample Size:

2.00 g

Sample Receipt Date: N/A

Initial Calibration Date:

18-Mar-2020

Extraction Date: 15-Jun-2020

Instrument ID:

LCMS/MS

Analysis Date: 17-Jun-2020 **Time:** 11:48:23

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC0L_193 S: 73

Injection Volume (uL): 2

Blank Data Filename:

FC0L_193 S: 73

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC0L_193 S: 68

Concentration Units: ng/g

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.800 (L)	
PFPeA	U		0.400 (L)	
PFHxA	U		0.200 (L)	
PFHpA	U		0.200 (L)	
PFOA	U		0.200 (L)	
PFNA	U		0.200 (L)	
PFDA	U		0.200 (L)	
PFUnA	U		0.200 (L)	
PFDoA	U		0.200 (L)	
PFTrDA	U		0.200 (L)	
PFTeDA	U		0.200 (L)	
PFBS	U		0.200 (L)	
PFPeS	U		0.200 (L)	
PFHxS	U		0.200 (L)	
PFHpS	U		0.200 (L)	
PFOS	J	0.242	0.200 (L)	
PFNS	U		0.200 (L)	
PFDS	U		0.200 (L)	
PFDoS	U H		0.200 (L)	
4:2 FTS	U		0.800 (L)	
6:2 FTS	U		0.720 (L)	
8:2 FTS	U		0.800 (L)	
PFOSA	U		0.200 (L)	
N-MeFOSA	U		0.230 (L)	
N-EtFOSA	U		0.500 (L)	
MeFOSAA	U		0.200 (L)	
EtFOSAA	U		0.200 (L)	
N-MeFOSE	U H		2.00 (L)	
N-EtFOSE	U		1.50 (L)	
HFPO-DA	U		0.760 (L)	
ADONA	U		0.800 (L)	
9CI-PF3ONS	U		0.800 (L)	
11CI-PF3OUdS	U		0.800 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; J = concentration less than limit of quantification; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonso _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Lab Blank
Sample Collection:
N/A

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:

TISSUE

Project No.

N/A

Sample Receipt Date:

N/A

Lab Sample I.D.:

WG72536-101

Extraction Date:

15-Jun-2020

Instrument ID:

LCMS/MS

Analysis Date: 17-Jun-2020 **Time:** 11:48:23

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC0L_193 S: 73

Injection Volume (uL): 2

Blank Data Filename:

FC0L_193 S: 73

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC0L_193 S: 68

Concentration Units: ng absolute

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		80.0	65.3	81.6	1:51
13C5-PFPeA		40.0	37.1	92.8	4:25
13C5-PFHxA		20.0	17.4	86.9	5:01
13C4-PFHxA		20.0	15.9	79.7	5:28
13C8-PFOA		20.0	16.6	82.9	6:12
13C9-PFNA		10.0	8.14	81.4	7:03
13C6-PFDA		10.0	9.28	92.8	7:33
13C7-PFUuA		10.0	9.01	90.1	7:53
13C2-PFDuA		10.0	8.64	86.4	8:08
13C2-PFTeDA		10.0	8.08	80.8	8:51
13C3-PFBS		20.0	17.3	86.6	4:58
13C3-PFHxS		20.0	16.4	82.0	6:18
13C8-PFOS		20.0	17.9	89.5	7:39
13C2-4:2 FTS		40.0	51.8	130	4:54
13C2-6:2 FTS		40.0	32.2	80.6	5:54
13C2-8:2 FTS		40.0	35.4	88.4	7:23
13C8-PFOSA		20.0	21.6	108	8:45
D3-N-MeFOSA		20.0	11.5	57.3	10:10
D5-N-EtFOSA		20.0	11.2	56.2	10:27
D3-MeFOSAA		40.0	49.2	123	7:36
D5-EtFOSAA		40.0	64.4	161	7:45
d7-NMe-FOSE		200	7.77	3.88	10:02
d9-NEt-FOSE		200	92.2	46.1	10:20
13C3-HFPO-DA		80.0	62.3	77.9	5:10

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 11:40:36; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_WG72536-101_Form2_FC0L_193S73_SJ2755742.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02**Form 8A****PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)****SGS AXYS ANALYTICAL SERVICES**

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4066	Lab Sample I.D.:	WG72536-102
Matrix:	TISSUE	Initial Calibration Date:	18-Mar-2020
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 11:22:21	Column ID:	C18
Extract Volume (uL):	4000	OPR Data Filename:	FC0L_193 S: 71
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

COMPOUND	LAB FLAG¹	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
PFBA		40.0	38.4	95.9	1:52
PFPeA		20.0	19.5	97.5	4:25
PFHxA		10.0	9.38	93.8	5:01
PFHpA		10.0	9.25	92.5	5:28
PFOA		10.0	8.93	89.3	
PFNA		10.0	9.71	97.1	
PFDA		10.0	8.96	89.6	7:33
PFUnA		10.0	9.31	93.1	7:53
PFDoA		10.0	9.20	92.0	8:08
PFTrDA		10.0	9.25	92.5	8:26
PFTeDA		10.0	9.76	97.6	8:50
PFBS		10.0	9.42	94.2	4:58
PFPeS		10.0	10.1	101	5:30
PFHxS		10.0	9.40	94.0	
PFHpS		10.0	9.37	93.7	7:09
PFOS		10.0	9.13	91.3	
PFNS		10.0	7.89	78.9	7:58
PFDS		10.0	9.09	90.9	8:14
PFDoS	H	10.0	9.39	93.9	9:00
4:2 FTS		40.0	40.4	101	4:54
6:2 FTS		36.1	37.5	104	5:54
8:2 FTS		40.0	38.5	96.3	7:23
PFOSA		10.0	10.2	102	
N-MeFOSA		11.5	13.4	117	
N-EtFOSA		25.0	22.9	91.6	
MeFOSAA		10.0	10.3	103	
EtFOSAA		10.0	9.11	91.1	
N-MeFOSE	H N	100	199	199	
N-EtFOSE		75.0	68.5	91.4	
HFPO-DA		38.0	45.5	120	5:10
ADONA	N	40.0	55.1	138	5:41
9CI-PF3ONS		40.0	51.6	129	7:52
11CI-PF3OUdS		40.0	51.3	128	8:27

(1) Where applicable, custom lab flags have been used on this report; N = authentic recovery in the OPR is not within method/contract control limits; H = concentration is estimated.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

SGS AXYS METHOD MLA-110 Rev 02

Form 8B

PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4066	Lab Sample I.D.:	WG72536-102
Matrix:	TISSUE	Initial Calibration Date:	18-Mar-2020
Extraction Date:	15-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	17-Jun-2020 Time: 11:22:21	Column ID:	C18
Extract Volume (uL):	4000	OPR Data Filename:	FC0L_193 S: 71
Injection Volume (uL):	2	Blank Data Filename:	FC0L_193 S: 73
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_193 S: 68

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
13C4-PFBA		40.0	36.3	90.8	1:51
13C5-PFPeA		20.0	19.6	98.1	4:25
13C5-PFHxA		10.0	9.67	96.7	5:01
13C4-PFHpA		10.0	9.58	95.8	5:28
13C8-PFOA		10.0	8.99	89.9	6:12
13C9-PFNA		5.00	4.66	93.2	7:03
13C6-PFDA		5.00	4.86	97.3	7:33
13C7-PFUnA		5.00	4.85	96.9	7:53
13C2-PFDmA		5.00	4.98	99.6	8:08
13C2-PFTeDA		5.00	4.32	86.4	8:50
13C3-PFBs		10.0	9.77	97.7	4:58
13C3-PFHxS		10.0	9.27	92.7	6:18
13C8-PFOS		10.0	9.71	97.1	7:38
13C2-4:2 FTS		20.0	36.3	181	4:54
13C2-6:2 FTS		20.0	21.9	110	5:54
13C2-8:2 FTS		20.0	30.6	153	7:23
13C8-PFOSA		10.0	9.99	99.9	8:45
D3-N-MeFOSA		10.0	3.27	32.7	10:10
D5-N-EtFOSA		10.0	5.32	53.2	10:27
D3-MeFOSAA		20.0	31.5	157	7:36
D5-EtFOSAA		20.0	38.6	193	7:44
d7-NMe-FOSE		100	5.38	5.38	10:01
d9-NEt-FOSE		100	25.4	25.4	10:19
13C3-HFPO-DA		40.0	27.7	69.3	5:10

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

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Report Filename: PFC_FC_LC_PFAS_WG72536-102_Form8B_SJ2755739.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02**Form 8G****CERTIFIED REFERENCE MATERIAL (CRM) REPORT FOR NIST SRM 1947****SGS AXYS ANALYTICAL SERVICES**

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4066	Lab Sample I.D.:	WG72536-103
Matrix:	TISSUE	Sample Size:	2.03 g (wet)
Extraction Date:	15-Jun-2020	Initial Calibration Date:	18-Mar-2020
Analysis Date:	17-Jun-2020 Time: 15:16:35	Instrument ID:	LCMS/MS
Extract Volume (uL):	4000	GC Column ID:	C18
Injection Volume (uL):	2	Sample Data Filename:	FC0L_193 S: 89
Dilution Factor:	N/A	Blank Data Filename:	FC0L_193 S: 73
Concentration Units:	ng/g (wet weight basis)	Cal. Ver. Data Filename:	FC0L_193 S: 68

COMPOUND	CAS. NO.	LAB FLAG¹	DETERMINED	CERTIFIED / REFERENCE
PFOS	45298-90-6		5.40	5.9 +/- 0.39

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

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SGS AXYS METHOD MLA-110 Rev 02

Form 8H

CERTIFIED REFERENCE MATERIAL (CRM) REPORT FOR NIST SRM 1947

SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4066	Lab Sample I.D.:	WG72536-103
Matrix:	TISSUE	Sample Size:	2.03 g (wet)
Extraction Date:	15-Jun-2020	Initial Calibration Date:	18-Mar-2020
Analysis Date:	17-Jun-2020 Time: 15:16:35	Instrument ID:	LCMS/MS
Extract Volume (uL):	4000	GC Column ID:	C18
Injection Volume (uL):	2	Sample Data Filename:	FC0L_193 S: 89
Dilution Factor:	N/A	Blank Data Filename:	FC0L_193 S: 73
Concentration Units:	ng absolute	Cal. Ver. Data Filename:	FC0L_193 S: 68

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	ION ABUND. RATIO	RRT
13C4-PFBA		40.0	34.6	86.4		
13C5-PFPeA		20.0	19.9	99.6		
13C5-PFHxA		10.0	9.15	91.5		
13C4-PFHpA		10.0	8.56	85.6		
13C8-PFOA		10.0	8.68	86.8		
13C9-PFNA		5.00	4.31	86.1		
13C6-PFDA		5.00	4.91	98.2		
13C7-PFUnA		5.00	4.73	94.6		
13C2-PFDaA		5.00	4.48	89.6		
13C2-PFTeDA		5.00	3.35	67.0		
13C3-PFBs		10.0	8.75	87.5		
13C3-PFHxS		10.0	8.35	83.5		
13C8-PFOS		10.0	10.1	101		
13C2-4:2 FTS		20.0	31.5	158		
13C2-6:2 FTS		20.0	25.9	129		
13C2-8:2 FTS		20.0	33.7	169		
13C8-PFOSA		10.0	10.5	105		
D3-N-MeFOSA		10.0	6.18	61.8		
D5-N-EtFOSA		10.0	3.82	38.2		
D3-MeFOSAA		20.0	32.9	165		
D5-EtFOSAA		20.0	35.7	179		
d7-NMe-FOSE		100	2.73	2.73		
d9-NEt-FOSE		100	17.0	17.0		
13C3-HFPO-DA		40.0	26.0	65.1		

(1) Where applicable, custom lab flags have been used on this report.

(2) R% = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

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 Report Filename: _FC_LC_PFAS_WG72536-103_Form8H_SJ2755759.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 3A
LC MS/MS INITIAL CALIBRATION PERCENT RECOVERIES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC0L_082 S: 10

CS2 Data Filename: FC0L_082 S: 11

CS3 Data Filename: FC0L_082 S: 12

CS4 Data Filename: FC0L_082 S: 13

CS5 Data Filename: FC0L_082 S: 14

CS6 Data Filename: FC0L_082 S: 15

CS7 Data Filename: FC0L_082 S: 16

CS8 Data Filename: N/A

COMPOUND	LAB FLAG ¹	PERCENT RECOVERY (%)								
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
PFBA		105	104	101	99.8	94.2	96.1	100		
PFPeA		102	105	100	101	94.3	97.4	100		
PFHxA		112	108	101	98.0	88.5	94.8	97.3		
PFHpA		115	110	97.6	92.5	92.6	96.9	95.4		
PFOA		118	111	103	91.3	86.1	95.5	94.8		
PFNA		105	98.7	97.9	105	90.6	98.1	105		
PFDA		103	112	99.4	96.1	93.4	91.8	104		
PFUnA		99.9	99.9	102	103	96.3	102	97.3		
PFDoA		100	97.1	88.5	125	102	104	83.9		
PFTrDA		94.2	106	103	114	95.7	87.5			
PFTeDA		119	111	106	105	95.9	87.9	74.8		
PFBS		102	108	101	103	94.0	93.8	98.1		
PFPeS		102	106	101	105	97.1	97.7	90.3		
PFHxS		101	103	101	97.2	91.2	97.3	109		
PFHpS		100	114	101	99.9	90.6	95.7	98.7		
PFOS		119	115	91.5	93.3	89.6	91.4	101		
PFNS		114	129	76.4	83.2	81.8	107	108		
PFDS		112	118	93.5	94.2	91.1	90.4	101		
PFDoS		99.1	117	97.2	99.1	91.9	93.7	102		
4:2 FTS		114	101	102	111	99.9	95.9	76.0		
6:2 FTS		110	117	98.7	100	91.5	82.6			
8:2 FTS		94.7	117	102	100	100	85.4			
PFOSA		109	103	96.9	98.6	94.3	96.3	102		
N-MeFOSA		92.0	116	108	109	98.9	96.2	80.2		
N-EtFOSA		96.6	112	99.7	97.5	95.4	97.1	102		
MeFOSAA		98.3	104	97.0	110	97.2	102	91.0		
EtFOSAA		121	80.0	110	102	93.5	91.3	102		
N-MeFOSE		107	106	103	101	94.2	95.5	93.8		
N-EtFOSE		101	105	107	102	95.3	96.9	93.0		
HFPO-DA		104	104	105	106	99.2	95.5	86.5		
ADONA		104	98.2	99.7	102	99.3	95.9	101		
9CI-PF3ONS		105	111	104	107	97.3	90.9	84.9		
11CI-PF3OUdS		106	109	101	98.1	94.7	94.3	96.9		

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

For Axys Internal Use Only [XSL Template: FC-Form3A.xsl; Created: 21-Jul-2020 11:40:36; Application: XMLTransformer-1.18.8;
Report Filename: PFOA_FC_LC_18-Mar-2020_FC0L__Form3A_GS87821.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 3B
LC MS/MS INITIAL CALIBRATION PERCENT RECOVERIES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC0L_082 S: 10

CS2 Data Filename: FC0L_082 S: 11

CS3 Data Filename: FC0L_082 S: 12

CS4 Data Filename: FC0L_082 S: 13

CS5 Data Filename: FC0L_082 S: 14

CS6 Data Filename: FC0L_082 S: 15

CS7 Data Filename: FC0L_082 S: 16

CS8 Data Filename: N/A

LABELED COMPOUND	LAB FLAG ¹	PERCENT RECOVERIES (%)							
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7
13C4-PFBA		99.0	102	99.9	99.7	100	99.5	99.1	
13C5-PFPeA		108	106	104	105	103	94.5	79.2	
13C5-PFHxA		102	103	99.3	101	102	99.2	94.1	
13C4-PFHxA		95.2	106	105	106	106	94.9	86.8	
13C8-PFOA		97.0	101	103	101	106	95.5	95.7	
13C9-PFNA		97.7	105	104	99.3	97.3	102	95.1	
13C6-PFDA		114	108	82.8	113	106	98.3	77.0	
13C7-PFUuA		114	118	103	103	93.3	67.7		
13C2-PFDuA		111	111	96.0	85.8	98.6	94.8	103	
13C2-PFTeDA		97.0	102	95.6	94.2	94.1	99.3	118	
13C3-PFBS		97.7	112	105	102	101	99.2	82.6	
13C3-PFHxS		101	104	102	99.9	101	101	91.4	
13C8-PFOS		99.7	88.7	104	104	100	105	98.6	
13C2-4:2 FTS		105	116	109	96.6	73.2			
13C2-6:2 FTS		105	116	115	106	88.3	70.0		
13C2-8:2 FTS		111	116	116	114	85.5	71.7	85.6	
13C8-PFOSA		92.4	95.4	90.5	92.6	90.8	104	134	
D3-N-MeFOSA		97.8	101	88.3	95.5	100	118		
D5-N-EtFOSA		97.3	96.0	91.1	95.6	90.7	107	122	
D3-MeFOSAA		96.2	92.6	97.5	93.6	95.9	103	121	
D5-EtFOSAA		97.5	100	93.2	97.7	96.2	109	106	
d7-NMe-FOSE		95.8	95.8	89.7	96.2	95.8	107	120	
d9-NEt-FOSE		95.6	98.2	88.6	95.4	93.9	105	124	
13C3-HFPO-DA		109	110	110	107	101	90.0	72.7	

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

For Axys Internal Use Only [XSL Template: FC-Form3B.xsl; Created: 21-Jul-2020 11:40:36; Application: XMLTransformer-1.18.8;
Report Filename: PFOA_FC_LC_18-Mar-2020_FC0L__Form3B_GS87821.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 3C
LC MS/MS INITIAL CALIBRATION RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A
CS1 Data Filename: FC0L_082 S: 10

CS2 Data Filename: FC0L_082 S: 11

CS3 Data Filename: FC0L_082 S: 12

CS4 Data Filename: FC0L_082 S: 13

CS5 Data Filename: FC0L_082 S: 14

CS6 Data Filename: FC0L_082 S: 15

CS7 Data Filename: FC0L_082 S: 16

CS8 Data Filename: N/A

COMPOUND	LAB FLAG ¹	RETENTION TIMES								MEAN RT
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	
PFBA		1:58	1:58	1:58	1:58	1:58	1:58	1:58	1:58	1:58
PFPeA		4:19	4:19	4:19	4:19	4:19	4:19	4:19	4:19	4:19
PFHxA		4:54	4:54	4:53	4:53	4:54	4:54	4:54	4:54	4:54
PFHpA		5:23	5:23	5:23	5:23	5:23	5:23	5:23	5:24	5:23
PFOA		6:11	6:11	6:11	6:11	6:11	6:11	6:11	6:11	6:11
PFNA		7:02	7:03	7:02	7:03	7:02	7:02	7:02	7:02	7:02
PFDA		7:34	7:34	7:33	7:34	7:33	7:34	7:33	7:34	7:34
PFUnA		7:54	7:54	7:53	7:54	7:54	7:54	7:54	7:54	7:54
PFDoA		8:10	8:10	8:10	8:10	8:10	8:10	8:10	8:10	8:10
PFTrDA		8:30	8:30	8:29	8:29	8:30	8:30	8:30	8:30	8:30
PFTeDA		8:55	8:55	8:55	8:55	8:55	8:55	8:55	8:55	8:55
PFBS		4:51	4:51	4:51	4:51	4:51	4:51	4:51	4:51	4:51
PFPeS		5:25	5:26	5:25	5:25	5:25	5:25	5:26	5:26	5:25
PFHxS		6:17	6:17	6:17	6:17	6:17	6:17	6:17	6:17	6:17
PFHpS		7:09	7:09	7:09	7:09	7:09	7:09	7:09	7:09	7:09
PFOS		7:40	7:40	7:39	7:40	7:39	7:40	7:39	7:40	7:40
PFNS		7:59	7:59	7:59	7:59	7:59	7:59	7:59	7:59	7:59
PFDS		8:16	8:16	8:16	8:16	8:16	8:16	8:16	8:16	8:16
PFDoS		9:06	9:06	9:06	9:06	9:06	9:06	9:06	9:06	9:06
4:2 FTS		4:46	4:46	4:46	4:46	4:46	4:46	4:46	4:46	4:46
6:2 FTS		5:51	5:51	5:51	5:51	5:51	5:51	5:51	5:51	5:51
8:2 FTS		7:24	7:23	7:23	7:23	7:23	7:23	7:23	7:23	7:23
PFOSA		8:45	8:45	8:45	8:45	8:45	8:45	8:45	8:45	8:45
N-MeFOSA		10:12	10:12	10:12	10:12	10:12	10:12	10:12	10:12	10:12
N-EtFOSA		10:30	10:30	10:31	10:30	10:30	10:30	10:30	10:30	10:30
MeFOSAA		7:37	7:37	7:37	7:37	7:37	7:37	7:37	7:37	7:37
EtFOSAA		7:46	7:46	7:45	7:46	7:45	7:46	7:45	7:46	7:46
N-MeFOSE		10:04	10:03	10:04	10:04	10:04	10:04	10:04	10:04	10:04
N-EtFOSE		10:23	10:23	10:23	10:23	10:23	10:23	10:23	10:23	10:23
HFPO-DA		5:03	5:03	5:03	5:03	5:03	5:03	5:03	5:03	5:03
ADONA		5:38	5:38	5:38	5:38	5:38	5:38	5:38	5:38	5:38
9CI-PF3ONS		7:54	7:54	7:53	7:53	7:53	7:54	7:53	7:53	7:53
11CI-PF3OUdS		8:31	8:31	8:31	8:31	8:31	8:31	8:31	8:31	8:31

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

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SGS AXYS METHOD MLA-110 Rev 02

Form 3D
LC MS/MS INITIAL CALIBRATION RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC0L_082 S: 10

CS2 Data Filename: FC0L_082 S: 11

CS3 Data Filename: FC0L_082 S: 12

CS4 Data Filename: FC0L_082 S: 13

CS5 Data Filename: FC0L_082 S: 14

CS6 Data Filename: FC0L_082 S: 15

CS7 Data Filename: FC0L_082 S: 16

CS8 Data Filename: N/A

LAB FLAG ¹	RETENTION TIMES								MEAN RT
	CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
LABELED COMPOUND									
13C4-PFBA	1:57	1:57	1:57	1:57	1:57	1:57	1:57	1:57	1:57
13C5-PFPeA	4:18	4:19	4:18	4:18	4:19	4:19	4:19	4:19	4:19
13C5-PFHxA	4:53	4:53	4:53	4:53	4:53	4:54	4:54	4:53	4:53
13C4-PFHpA	5:23	5:23	5:23	5:23	5:23	5:23	5:23	5:23	5:23
13C8-PFOA	6:11	6:11	6:11	6:11	6:11	6:11	6:11	6:11	6:11
13C9-PFNA	7:02	7:02	7:02	7:02	7:02	7:02	7:02	7:02	7:02
13C6-PFDA	7:34	7:34	7:33	7:34	7:33	7:33	7:33	7:33	7:33
13C7-PFUnA	7:54	7:54	7:53	7:54	7:53	7:54	7:54	7:54	7:54
13C2-PFDaA	8:10	8:10	8:10	8:10	8:10	8:10	8:10	8:10	8:10
13C2-PFTeDA	8:55	8:55	8:55	8:55	8:55	8:55	8:55	8:55	8:55
13C3-PFBS	4:51	4:51	4:51	4:51	4:51	4:51	4:51	4:51	4:51
13C3-PFHxS	6:17	6:17	6:17	6:17	6:17	6:17	6:17	6:17	6:17
13C8-PFOS	7:40	7:40	7:39	7:40	7:39	7:40	7:39	7:40	7:40
13C2-4:2 FTS	4:46	4:46	4:46	4:46	4:46	4:46			4:46
13C2-6:2 FTS	5:51	5:51	5:51	5:51	5:51	5:51			5:51
13C2-8:2 FTS	7:23	7:24	7:23	7:23	7:23	7:23			7:23
13C8-PFOSA	8:45	8:45	8:45	8:45	8:45	8:45			8:45
D3-N-MeFOSA	10:11	10:11	10:12	10:11	10:12	10:11			10:11
D5-N-EtFOSA	10:30	10:30	10:30	10:30	10:30	10:30			10:30
D3-MeFOSAA	7:37	7:37	7:37	7:37	7:37	7:37			7:37
D5-EtFOSAA	7:45	7:45	7:45	7:45	7:45	7:45			7:45
d7-NMe-FOSE	10:03	10:02	10:03	10:03	10:03	10:03			10:03
d9-NEt-FOSE	10:22	10:22	10:22	10:22	10:22	10:22			10:22
13C3-HFPO-DA	5:03	5:03	5:03	5:03	5:03	5:03			5:03

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

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SGS AXYS METHOD MLA-110 Rev 02

Form 4A
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date:	18-Mar-2020	VER Data Filename:	FC0L_193 S: 68
Instrument ID:	LCMS/MS	Analysis Date:	17-Jun-2020
LC Column ID:	C18	Analysis Time:	10:43:08

COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
PFBA		1:54	40.0	38.9	97.3
PPPeA		4:26	20.0	19.5	97.5
PFHxA		5:01	10.0	9.54	95.4
PFHpA		5:29	10.0	9.92	99.2
PFOA		6:13	10.0	9.29	92.9
PFNA		7:03	10.0	9.90	99.0
PFDA		7:33	10.0	9.13	91.3
PFUnA		7:53	10.0	9.89	98.9
PFDoA		8:09	10.0	11.1	111
PFTrDA		8:27	10.0	10.2	102
PFTeDA		8:52	10.0	10.4	104
PFBS		4:59	10.0	9.44	94.4
PPPeS		5:30	10.0	10.4	104
PFHxS		6:19	10.0	9.79	97.9
PFHpS		7:10	10.0	9.94	99.4
PFOS		7:39	10.0	9.17	91.7
PFNS		7:58	10.0	10.4	104
PFDS		8:15	10.0	10.0	100
PFDoS		9:02	10.0	9.92	99.2
4:2 FTS		4:54	40.0	44.7	112
6:2 FTS		5:55	36.0	34.7	96.5
8:2 FTS		7:23	40.0	38.1	95.2
PFOSA		8:44	10.0	10.0	100
N-MeFOSA		10:10	11.5	12.4	107
N-EtFOSA		10:28	25.0	23.5	94.1
MeFOSAA		7:37	10.0	10.7	107
EtFOSAA		7:45	10.0	9.78	97.8
N-MeFOSE		10:03	100	101	101
N-EtFOSE		10:21	75.0	76.0	101
HFPO-DA		5:10	40.0	42.2	106
ADONA		5:42	40.0	43.8	109
9CI-PF3ONS		7:53	40.0	47.0	117
11CI-PF3OUdS		8:29	40.0	45.8	114

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

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 Report Filename: PFOA_FC_LC_FC0L_193S68__Form4A_SJ2755736.html; Workgroup: WG72536; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 4B
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date:	18-Mar-2020	VER Data Filename:	FC0L_193 S: 68
Instrument ID:	LCMS/MS	Analysis Date:	17-Jun-2020
LC Column ID:	C18	Analysis Time:	10:43:08

LABELED COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
13C4-PFBA		1:54	40.0	39.2	97.9
13C5-PFPeA		4:26	20.0	22.0	110
13C5-PFHxA		5:01	10.0	10.5	105
13C4-PFHpA		5:29	10.0	10.2	102
13C8-PFOA		6:13	10.0	9.87	98.7
13C9-PFNA		7:03	5.00	4.97	99.5
13C6-PFDA		7:33	5.00	5.44	109
13C7-PFUnA		7:53	5.00	5.11	102
13C2-PFDaA		8:09	5.00	4.98	99.6
13C2-PFTeDA		8:52	5.00	4.81	96.2
13C3-PFBS		4:59	9.18	10.4	113
13C3-PFHxS		6:19	10.0	10.3	103
13C8-PFOS		7:39	10.0	10.2	102
13C2-4:2 FTS		4:54	20.0	16.5	82.5
13C2-6:2 FTS		5:55	20.0	17.5	87.5
13C2-8:2 FTS		7:23	20.0	19.7	98.3
13C8-PFOSA		8:44	10.0	9.51	95.1
D3-N-MeFOSA		10:10	10.0	10.6	106
D5-N-EtFOSA		10:27	10.0	10.5	105
D3-MeFOSAA		7:37	20.0	17.5	87.7
D5-EtFOSAA		7:45	20.0	17.9	89.3
d7-NMe-FOSE		10:02	100	108	108
d9-NEt-FOSE		10:19	100	113	113
13C3-HFPO-DA		5:10	40.0	36.8	92.0

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

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 Report Filename: PFOA_FC_LC_FC0L_193S68__Form4B_SJ2755736.html; Workgroup: WG72536; Design ID: 3990]

Accreditation Scope
SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 50

Accreditation Scope
SGS AXYS Analytical Services Ltd.
file ref: ACC-101 Rev. 50

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum								Solids			
				CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS
Endrin aldehyde	EPA 608	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8081	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-007	MLA-007	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028
Endrin ketone	EPA 8081	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-007	MLA-007	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028
GammahCH (Undane)	EPA 8081	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-007	MLA-007	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028
Heptachlor	EPA 825	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8081	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Heptachlor epoxide	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Heptachlorobenzene	EPA 8081	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-007	MLA-007	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028
Heptachlor	EPA 8081	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-007	MLA-007	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028
Hexachlorobenzene	EPA 8081	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-007	MLA-007	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028
Methoxychlor	EPA 8081	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-007	MLA-007	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028
Mirex	EPA 8081	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-007	MLA-007	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028
Oxydoradane	EPA 8081	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-007	MLA-007	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028
Tropane	EPA 8270	MLA-007	SGS AXYS MLA-007	MLA-007	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028
trans-Chlorodane (gamma-Chlordane)	EPA 8270	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-007	MLA-007	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028
trans-Nonachlor	EPA 8270	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-007	MLA-007	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028	MLA-028	SGS AXYS MLA-028
PAH	EPA 8270	MLA-021	Extractive Organics* category (CA only)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Serum	Solids	Tissue	Urine	Water	Water, Non-Potable	AFFF
	1,2,6-Trimethylbenzene	SGS AXYS MLA-021	MLA-021	Y							
	1,4,6,7-Tetramethylbenzene	SGS AXYS MLA-021	MLA-021	Y							
	1,7-Dimethylfluorene	SGS AXYS MLA-021	MLA-021	Y							
	1,7-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021	Y							
	1,8-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021	Y							
	1-Methyltropyne	SGS AXYS MLA-021	MLA-021	Y							
	1-Helvynaphthalene	SGS AXYS MLA-021	MLA-021	Y							
	1-Methylphenanthrene	SGS AXYS MLA-021	MLA-021	Y							
	2,3,5-Trimethylphenanthrene	SGS AXYS MLA-021	MLA-021	Y							
	2,3,6-Trimethylphenanthrene	SGS AXYS MLA-021	MLA-021	Y							
	2,4-Dimethylbenzocycloheptene	SGS AXYS MLA-021	MLA-021	Y							
	2,6-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021	Y							
	2,6-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021	Y							
	2-Methylanthracene	SGS AXYS MLA-021	MLA-021	Y							
	2-Methylbenzothiophene	SGS AXYS MLA-021	MLA-021	Y							
	2-Methylfluorene	EPA 8270	MLA-021	Y							
	2-Methylnaphthalene	SGS AXYS MLA-021	MLA-021	Y							
	2,6-Dimethylnaphthalene	SGS AXYS MLA-021	MLA-021	Y							
	3,6-Dimethylnaphthalene	SGS AXYS MLA-021	MLA-021	Y							
	3,6-Dimethylbenzothiophene	SGS AXYS MLA-021	MLA-021	Y							
	3-Methylfloranthene	SGS AXYS MLA-021	MLA-021	Y							
	3-Methylnaphthalene	SGS AXYS MLA-021	MLA-021	Y							
	5,9-Dimethylxylene	SGS AXYS MLA-021	MLA-021	Y							
	5,6-Dimethylxylanes	SGS AXYS MLA-021	MLA-021	Y							
	7,8-Dimethylbenzofluoranthene	SGS AXYS MLA-021	MLA-021	Y							
	9,10-Methylphenanthrenes	SGS AXYS MLA-021	MLA-021	Y							
	Acenaphthene	EPA 1625	MLA-021	Y							
	Anthracene	EPA 8270	MLA-021	Y							
	Acenaphthylene	EPA 1625	MLA-021	Y							
	Benz[a]anthracene	EPA 8270	MLA-021	Y							
	Benz[b]anthracene	EPA 1625	MLA-021	Y							
	Benz[j]fluoranthene	EPA 8270	MLA-021	Y							
	Benzofluoranthene	EPA 1625	MLA-021	Y							
	Benz[e]pyrene	EPA 1625	MLA-021	Y							
	Benz[g]heptalene	EPA 8270	MLA-021	Y							
	Biphenyl	EPA 8270	MLA-021	Y							
	C1-Aceanaphthenes	EPA 8270	MLA-021	Y							
	C1-Benzo(a)anthracenes	EPA 8270	MLA-021	Y							
	C1-Biphenyls	EPA 8270	MLA-021	Y							
	C1-Dibenzofuranophene	EPA 8270	MLA-021	Y							
	C1-Fluoranthenes/Pyrenes	EPA 8270	MLA-021	Y							
	C1-Fluorenes	EPA 8270	MLA-021	Y							
	C1-Naphthalenes	EPA 8270	MLA-021	Y							

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum		Solids
				CALA	Alaska DEC ANAB DoD ** ANAB ISO 17025	
C1-Pheanthrenes/Antrazenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Benz(a)anthracenes/Cintronenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Benzo(a)anthracenes/Benzopyrenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Biphenyl		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Dibenzanthracene		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Dibenzanthracenes/Pyrenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Fluoranthrenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Naphthalenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Pheanthrenes/Antrazenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C3-Benz(a)anthracenes/Cintronenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C3-Dibenzanthracene		SGS AXYS MLA-021	MLA-021	Y	Y	
C3-Fluoranthrenes/Pyrenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C3-Hydroxytes		SGS AXYS MLA-021	MLA-021	Y	Y	
C3-Naphthalenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C3-Pheanthrenes/Antrazenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C4-Benz(a)anthracenes/Cintronenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C4-Dibenzanthracene		SGS AXYS MLA-021	MLA-021	Y	Y	
C4-Fluoranthrenes/Pyrenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C4-Naphthalenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C4-Pheanthrenes/Antrazenes		SGS AXYS MLA-021	MLA-021	Y	Y	
Chrysene		EPA 16-25	MLA-021	Y	Y	
Dibenz(a)anthracene		SGS AXYS MLA-021	MLA-021	Y	Y	
Fluorene		EPA 16-25	MLA-021	Y	Y	
Dibenzothiophene		EPA 16-25	MLA-021	Y	Y	
Fluoranthene		EPA 16-25	MLA-021	Y	Y	
Indeno[1,2,3-cd]pyrene		EPA 16-25	MLA-021	Y	Y	
Naphthalene		EPA 16-25	MLA-021	Y	Y	
Perylene		EPA 16-25	MLA-021	Y	Y	
Phenanthrene		EPA 16-25	MLA-021	Y	Y	
Pyrene		EPA 16-25	MLA-021	Y	Y	
Retene		EPA 16-25	MLA-021	Y	Y	
BDE-10,2,6-dibromodiphenylether		EPA 16-14	MLA-033	Y	Y	
BDE-10,2,2,4,4'-pentabromodiphenylether		SGS AXYS MLA-033	MLA-033	Y	Y	
BDE-10,2,3,4,4'-pentabromodiphenylether		EPA 16-14	MLA-033	Y	Y	
BDE-11,3,3'-dibromodiphenylether		SGS AXYS MLA-033	MLA-033	Y	Y	
BDE-12,3,4-dibromodiphenylether		EPA 16-14	MLA-033	Y	Y	
BDE-12,3,3,4,4'-pentabromodiphenylether		SGS AXYS MLA-033	MLA-033	Y	Y	
BDE-11,2,3,4,4'-pentabromodiphenylether		EPA 16-14	MLA-033	Y	Y	
BDE-13,3,4-dibromodiphenylether		SGS AXYS MLA-033	MLA-033	Y	Y	
BDE-13,3,4-dibromodiphenylether		EPA 16-14	MLA-033	Y	Y	

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Serum	Alaska DEC	Tissue	Urine	AFFF
		SGS AXYS MLA-033	MLA-033		Solids	ANAB DoD **		Water	
BDE 140	2,2,3,4,4,6-hexabromodiphenylether	EPA 1614	MLA-033	Y		ANAB ISO 17025			
BDE 154	2,2,4,4,5,6-hexabromodiphenylether	EPA 1614	MLA-033	Y		CALA			
BDE 155	2,2,4,4,6,6-hexabromodiphenylether	EPA 1614	MLA-033	Y		California WB			
BDE 166	2,3,4,4,5,6-heptabromodiphenylether	EPA 1614	MLA-033	Y		Florida DOH			
BDE 172	2,4-tetrabromodiphenylether	EPA 1614	MLA-033	Y		Maine DOH			
BDE 181	2,2,3,4,5,6-heptabromodiphenylether	EPA 1614	MLA-033	Y		Minnesota DOH			
BDE 183	2,2,3,4,5,6-heptabromodiphenylether	EPA 1614	MLA-033	Y		New Jersey DEP			
BDE 190	2,2,3,4,5,6-heptabromodiphenylether	EPA 1614	MLA-033	Y		New York DOH			
BDE 206	2,2,3,4,5,5,6-nonabromodiphenylether	EPA 1614	MLA-033	Y		Virginia DGS			
BDE 207	2,2,3,4,5,6,6-nanabromodiphenylether	EPA 1614	MLA-033	Y		Washington DE			
BDE 208	2,2,3,4,5,5,6,6-nanabromodiphenylether	EPA 1614	MLA-033	Y		ANAB DoD **			
BDE 209	2,2,3,4,5,6-tetrabromodiphenylether	EPA 1614	MLA-033	Y		ANAB ISO 17025			
BDE 25	2,3,4-tetrabromodiphenylether	EPA 1614	MLA-033	Y		CALA			
BDE 35	2,4-tetrabromodiphenylether	EPA 1614	MLA-033	Y		Florida DOH			
BDE 37	3,4-tetrabromodiphenylether	EPA 1614	MLA-033	Y		Maine DOH			
BDE 47	2,2,4,4-tetrabromodiphenylether	EPA 1614	MLA-033	Y		Minnesota DOH			
BDE 49	2,2,4,5-tetrabromodiphenylether	EPA 1614	MLA-033	Y		New Jersey DEP			
BDE 66	2,3,4-tetrabromodiphenylether	EPA 1614	MLA-033	Y		New York DOH			
BDE 77	3,3,4-tetrabromodiphenylether	EPA 1614	MLA-033	Y		Pennsylvania DEP			
BDE 8	2,4-dibromodiphenylether	EPA 1614	MLA-033	Y		Virginia DGS			
BDE 85	2,2,3,4,4-tetrabromodiphenylether	EPA 1614	MLA-033	Y		Washington DE *			
BDE 99	2,2,4,5-pentabromodiphenylether	EPA 1614	MLA-033	Y		ANAB DoD **			
PCB Aroclors	"Organochlorine Pesticides and PCBs" category (Ca. only)	EPA 825	MLA-007	Y		ANAB ISO 17025			
	PCBs" category (Ca. only)	EPA 8270	MLA-007	Y		CALA			
	PCB Aroclor 1016	EPA 1668	MLA-010	Y		California WB			
		EPA 825	MLA-007	Y		Florida DOH			
		EPA 8270	MLA-007	Y		Maine DOH			
				Y		Minnesota DOH			
				Y		New Jersey DEP			
				Y		New York DOH			
				Y		Pennsylvania DEP			
				Y		Virginia DGS			
				Y		Washington DE *			

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Serum		Solids
					Alaska DEC	ANAB DoD **	
PCB 116,2,3,4,5,6-Pentachlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	
PCB 117,2,3,4,5,6-Pentachlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	
PCB 118,2,3,4,4',5-Pentachlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	
PCB 118,106	EPA 1668	MLA-010	Y	Y	Y	Y	
PCB 119,2,3,4,4',6-Pentachlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	
PCB 120,2,3,4,5,5-Pentachlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	
PCB 121,2,3,4,5,6-Pentachlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	
PCB 122,2,3,3',4,5-Pentachlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	
PCB 123,2,3,4,4',5-Pentachlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	
PCB 124,2,3,4,5,5-Pentachlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	
PCB 125,2,3,4,5,6-Pentachlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	
PCB 127,3,3,4,5,5-Pentachlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	
PCB 128,2,2,3,3,4,4'-Hexachlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum								Solids			
				CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS
PCB 23/34	PCB 23,6-Trichlorobiphenyl	EPA 8270	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 24/27	PCB 24,2,3,6-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 25/28	PCB 25,2,3,4-Trichlorobiphenyl	EPA 8270	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 26/28	PCB 26,2,3,5-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 27/28	PCB 27,2,3,6-Trichlorobiphenyl	EPA 8270	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 28/29	PCB 28,2,4,4-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 29/30	PCB 29,2,4,5-Trichlorobiphenyl	EPA 8270	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 30/31	PCB 30,2,4,5-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 31/32	PCB 31,2,4,5-Trichlorobiphenyl	EPA 8270	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 32/33	PCB 32,2,4,5-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 33/34	PCB 33,2,3,4-Trichlorobiphenyl	EPA 8270	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 34/35	PCB 34,2,3,5-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 35/36	PCB 35,3,3,4-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Compound Class	Compound	Serum									
		Solids					Tissue				
		Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	ANAB ISO 17025	CALA	Urine
PCB 36,3,3',5-Trichlorobiphenyl	EPA 8270	MLA-007	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 36,3,3',5-Trichlorobiphenyl	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 36,3,3',5-Trichlorobiphenyl	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Water
PCB 36,3,3',5-Trichlorobiphenyl	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Water
PCB 36,3,3',5-Trichlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 36,3,3',5-Trichlorobiphenyl	EPA 8270	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 36,3,3',5-Trichlorobiphenyl	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 36,3,3',5-Trichlorobiphenyl	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Water
PCB 36,3,3',5-Trichlorobiphenyl	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Water
PCB 37,3,4,4'-Trichlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 37,3,4,4'-Trichlorobiphenyl	EPA 8270	MLA-007	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 37,3,4,4'-Trichlorobiphenyl	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 37,3,4,4'-Trichlorobiphenyl	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Water
PCB 37,3,4,4'-Trichlorobiphenyl	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Water
PCB 38,3,4,5-Trichlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 38,3,4,5-Trichlorobiphenyl	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Water
PCB 38,3,4,5-Trichlorobiphenyl	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 38,3,4,5-Trichlorobiphenyl	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Water
PCB 38,3,4,5-Trichlorobiphenyl	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Water
PCB 39,3,4,5-Trichlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 39,3,4,5-Trichlorobiphenyl	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Water
PCB 39,3,4,5-Trichlorobiphenyl	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 39,3,4,5-Trichlorobiphenyl	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Water
PCB 39,3,4,5-Trichlorobiphenyl	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Water
PCB 41,10	EPA 8270	MLA-007	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 40,2,2,3,3'-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 40,2,2,3,3'-Tetrachlorobiphenyl	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Water
PCB 40,2,2,3,3'-Tetrachlorobiphenyl	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 40,2,2,3,3'-Tetrachlorobiphenyl	SGS AXYS MLA-007	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Water
PCB 40,2,2,3,3'-Tetrachlorobiphenyl	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Water
PCB 40,2,2,3,3'-Tetrachlorobiphenyl	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Water
PCB 41,2,2,3,4'-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 41,2,2,3,4'-Tetrachlorobiphenyl	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Water
PCB 41,2,2,3,4'-Tetrachlorobiphenyl	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 41,2,2,3,4'-Tetrachlorobiphenyl	SGS AXYS MLA-007	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Water
PCB 41,2,2,3,4'-Tetrachlorobiphenyl	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Water
PCB 41,2,2,3,4'-Tetrachlorobiphenyl	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Water
PCB 41,17,16,6,6,8	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Water
PCB 42,2,2,3,4'-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 42,2,2,3,4'-Tetrachlorobiphenyl	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Water
PCB 42,2,2,3,4'-Tetrachlorobiphenyl	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 42,2,2,3,4'-Tetrachlorobiphenyl	SGS AXYS MLA-007	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Water
PCB 42,2,2,3,4'-Tetrachlorobiphenyl	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Water
PCB 42,2,2,3,4'-Tetrachlorobiphenyl	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Water
PCB 42,2,2,3,5-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 42,2,2,3,5-Tetrachlorobiphenyl	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Water
PCB 42,2,2,3,5-Tetrachlorobiphenyl	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 42,2,2,3,5-Tetrachlorobiphenyl	SGS AXYS MLA-007	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Water
PCB 42,2,2,3,5-Tetrachlorobiphenyl	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Water
PCB 42,2,2,3,5-Tetrachlorobiphenyl	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Water
PCB 45,2,2,3,6-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 45,2,2,3,6-Tetrachlorobiphenyl	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Water
PCB 45,2,2,3,6-Tetrachlorobiphenyl	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 45,2,2,3,6-Tetrachlorobiphenyl	SGS AXYS MLA-007	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Water
PCB 45,2,2,3,6-Tetrachlorobiphenyl	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Water
PCB 45,2,2,3,6-Tetrachlorobiphenyl	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Water
PCB 46,2,2,3,6-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 46,2,2,3,6-Tetrachlorobiphenyl	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Water
PCB 46,2,2,3,6-Tetrachlorobiphenyl	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Water
PCB 46,2,2,3,6-Tetrachlorobiphenyl	SGS AXYS MLA-007	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Water
PCB 46,2,2,3,6-Tetrachlorobiphenyl	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Water
PCB 46,2,2,3,6-Tetrachlorobiphenyl	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Water

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SGS AXYS Analytical Services Ltd.
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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum								Solids			
				CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS
PCB 59,2,3,3',5-Tetrachlorobiphenyl	EPA 1668	SGS AXYS MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 59,2,3,3',6-Tetrachlorobiphenyl	EPA 8270	SGS AXYS MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 6,2,3-Dichlorobiphenyl	EPA 1668	SGS AXYS MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 60,2,3,4,4'-Tetrachlorobiphenyl	EPA 8270	SGS AXYS MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 61,2,3,4,5-Tetrachlorobiphenyl	EPA 1668	SGS AXYS MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 62,2,3,4,6-Tetrachlorobiphenyl	EPA 8270	SGS AXYS MLA-008	MLA-008	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 64,2,3,4,6-Tetrachlorobiphenyl	EPA 1668	SGS AXYS MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 65,16,6-Tetrachlorobiphenyl	EPA 8270	SGS AXYS MLA-008	MLA-008	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 67,2,3,4,5-Tetrachlorobiphenyl	EPA 1668	SGS AXYS MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 68,2,3,4,5-Tetrachlorobiphenyl	EPA 1668	SGS AXYS MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 69,2,3,4,5-Tetrachlorobiphenyl	EPA 1668	SGS AXYS MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 7,2,4-Dichlorobiphenyl	EPA 1668	SGS AXYS MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum								Solids
				CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Maine DOH	Minnesota DOH	
PCB 81,3,4,5-Tetrachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-007	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 82,2,2,3,3,4-Pentachlorobiphenyl	EPA 1668	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-007	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-010	MLA-010	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 83,2,2,3,3,4-Pentachlorobiphenyl	EPA 1668	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 83,2,2,3,3,5-Pentachlorobiphenyl	EPA 1668	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 83,108	EPA 8270	MLA-007	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 84,2,2,3,3,6-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-007	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-010	MLA-010	SGS AXYS MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 85,2,2,3,4,4'-Pentachlorobiphenyl	EPA 1668	MLA-908	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-010	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 85,120	EPA 8270	MLA-007	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 86,2,2,3,4,5-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-010	MLA-010	SGS AXYS MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 87,2,2,3,4,5-Pentachlorobiphenyl	EPA 1668	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-010	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 87,115,116	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-007	SGS AXYS MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-007	MLA-007	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 88,2,2,3,4,6-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-007	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-010	MLA-010	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 88,121	EPA 1668	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-007	SGS AXYS MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-007	MLA-007	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 89,2,2,3,4,6-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-010	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 90,2,2,3,4,5-Pentachlorobiphenyl	EPA 1668	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-007	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-010	MLA-010	SGS AXYS MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 91,2,2,3,4,6-Pentachlorobiphenyl	EPA 1668	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-007	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-010	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 92,2,2,3,5,5-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-007	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-010	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 93,2,2,3,5,6-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-007	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-010	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
ACC-103 Rev. 53, 26-Jun-2020	EPA 1668	MLA-010	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	AFFF
ACC-103 Rev. 53, 26-Jun-2020	EPA 1668	MLA-010	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	

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Compound Class	Compound	Accredited Method ID		CALA	Serum
		SGS AXYS MLA-075	MLA-075		
Diazepam		EPA 16.94	MLA-075	Y	Y
Digoxin		EPA 16.94	MLA-075	Y	Y
Diltiazem		EPA 16.94	MLA-075	Y	Y
Diphenhydramine		EPA 16.94	MLA-075	Y	Y
Dowycaine		EPA 16.94	MLA-075	Y	Y
Eralapril		EPA 16.94	MLA-075	Y	Y
Enrofloxacin		EPA 16.94	MLA-075	Y	Y
Erythromycin		EPA 16.94	MLA-075	Y	Y
Erythromycin azuolate		EPA 16.94	MLA-075	Y	Y
Flumequine		EPA 16.94	MLA-075	Y	Y
Fluconazole		EPA 16.94	MLA-075	Y	Y
Fluoxetine		EPA 16.94	MLA-075	Y	Y
Fluticasone propionate		EPA 16.94	MLA-075	Y	Y
Furosemide		EPA 16.94	MLA-075	Y	Y
Gemfibrozil		EPA 16.94	MLA-075	Y	Y
Glipizide		EPA 16.94	MLA-075	Y	Y
Glibenclamide		EPA 16.94	MLA-075	Y	Y
Hydrochlorothiazide		EPA 16.94	MLA-075	Y	Y
Hydrocodone		EPA 16.94	MLA-075	Y	Y
Hydrocortisone		EPA 16.94	MLA-075	Y	Y
Ibuprofen		EPA 16.94	MLA-075	Y	Y
Ischionotetacycline (ICTC)		EPA 16.94	MLA-075	Y	Y
Lincosycin		EPA 16.94	MLA-075	Y	Y
Lomefloxacin		EPA 16.94	MLA-075	Y	Y
Meprobamate		EPA 16.94	MLA-075	Y	Y
Mefenamic acid		EPA 16.94	MLA-075	Y	Y
Methylprednisolone		EPA 16.94	MLA-075	Y	Y
Methotrexate		EPA 16.94	MLA-075	Y	Y
Miconazole		EPA 16.94	MLA-075	Y	Y
Minoxidil		EPA 16.94	MLA-075	Y	Y
Naproxen		EPA 16.94	MLA-075	Y	Y
Nonoxokin		EPA 16.94	MLA-075	Y	Y
Norfluroxine		EPA 16.94	MLA-075	Y	Y
Norgestimimate		EPA 16.94	MLA-075	Y	Y
Nonverapamil		EPA 16.94	MLA-075	Y	Y
Oroxacin		EPA 16.94	MLA-075	Y	Y
Ometoprim		EPA 16.94	MLA-075	Y	Y
Oxacillin		EPA 16.94	MLA-075	Y	Y
Oxalic acid		EPA 16.94	MLA-075	Y	Y
Oxydone		EPA 16.94	MLA-075	Y	Y
Oxotetracycline (OTC)		EPA 16.94	MLA-075	Y	Y
Paroxetine		EPA 16.94	MLA-075	Y	Y
Penicillin G		EPA 16.94	MLA-075	Y	Y
Penicillin V		EPA 16.94	MLA-075	Y	Y

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Serum
Prednisolone		SGS AXYS MLA-075	MLA-075	Alaska DEC ANAB DoD ** ANAB ISO 17025	Solids
Prednisone		SGS AXYS MLA-075	MLA-075	CALA	
Promethazine		SGS AXYS MLA-075	MLA-075	California WB	
Propoxyphene		SGS AXYS MLA-075	MLA-075	Florida DOH	
Propriofenol		SGS AXYS MLA-075	MLA-075	Maine DOH	
Ranitidine	EPA 1694	MLA-075	MLA-075	Minnesota DOH	
Roxithromycin	EPA 1694	MLA-075	MLA-075	New Jersey DEP	
Sabatoxacin	EPA 1694	MLA-075	MLA-075	New York DOH	
Sertindole		SGS AXYS MLA-075	MLA-075	Virginia DGS	
Simvastatin		SGS AXYS MLA-075	MLA-075	Washington DE	
Sulfachloropyridazine		SGS AXYS MLA-075	MLA-075	ANAB DoD ** ANAB ISO 17025	Tissue
Sulfadiazine	EPA 1694	MLA-075	MLA-075	CALA	Urine
Sulfamethizole		SGS AXYS MLA-075	MLA-075	CALA	Water
Sulfadimethoxine	EPA 1694	MLA-075	MLA-075	Alaska DEC ANAB DoD ** ANAB ISO 17025	Water, Non-Potable
Sulfamerazine	EPA 1694	MLA-075	MLA-075	CALA	
Sulfameturazine	EPA 1694	MLA-075	MLA-075	California WB	
Sulfameturamide	EPA 1694	MLA-075	MLA-075	Florida DOH	
Sulfathiazole	EPA 1694	MLA-075	MLA-075	Maine DOH	
Sulfamethoxazole	EPA 1694	MLA-075	MLA-075	Minnesota DOH	
Sulfamerazine	EPA 1694	MLA-075	MLA-075	New Jersey DEP	
Sulfameturamide	EPA 1694	MLA-075	MLA-075	New York DOH	
Sulfathiazole	EPA 1694	MLA-075	MLA-075	Virginia DGS	
Tetracycline (TC)		SGS AXYS MLA-075	MLA-075	Washington DE	
Thiophendiline		SGS AXYS MLA-075	MLA-075	ANAB DoD ** ANAB ISO 17025	
Thiabendazole		SGS AXYS MLA-075	MLA-075	CALA	
Trembolone	EPA 1694	MLA-075	MLA-075	California WB	
Trembolone acetate		SGS AXYS MLA-075	MLA-075	Florida DOH	
Triamterene		SGS AXYS MLA-075	MLA-075	Maine DOH	
Tridoctran	EPA 1694	MLA-075	MLA-075	Minnesota DOH	
Triobsan		SGS AXYS MLA-075	MLA-075	New Jersey DEP	
Trimethoprim	EPA 1694	MLA-075	MLA-075	New York DOH	
Tyrosin	EPA 1694	MLA-075	MLA-075	Pennsylvania DEP	
Vasartan		SGS AXYS MLA-075	MLA-075	Virginia DGS	
Velegam		SGS AXYS MLA-075	MLA-075	Washington DE *	
Virginiamycin	EPA 1694	MLA-075	MLA-075	ANAB DoD ** ANAB ISO 17025	AFFF
Warfarin		SGS AXYS MLA-075	MLA-075		
Targeted Metabolites	11-14,17-eicosatetraenoic acid (eicosatrienoic acid)	SGS AXYS MLA-075	MLA-075		
	11,14-eicosadienoic acid	SGS AXYS MLA-001	MLM-001		
	3-hydroxyvitamine	SGS AXYS MLA-001	MLM-001		
	Acetylornithine	SGS AXYS MLA-001	MLM-001		
	Alanine	SGS AXYS MLA-001	MLM-001		
	alpha-Aminoadipic acid	SGS AXYS MLA-001	MLM-001		
	Arginine	SGS AXYS MLA-001	MLM-001		
	Asparagine	SGS AXYS MLA-001	MLM-001		
	Aspartate	SGS AXYS MLA-001	MLM-001		
	Asymmetric dimethylarginine	SGS AXYS MLA-001	MLM-001		
	Butyrylmalonate	SGS AXYS MLA-001	MLM-001		
	C22:8 ISOMER 1 (tentatively all-cis-4, 8, 12, 15, 19-docosapentaenoic acid)	SGS AXYS MLA-001	MLM-001		
	C22:8 ISOMER 2 (all-cis-7, 10, 13, 16-docosapentaenoic acid (DPA))	SGS AXYS MLA-001	MLM-001		
	C22:8 ISOMER 3 (tentatively all-cis-4, 7, 10, 13, 16-docosapentaenoic acid)	SGS AXYS MLA-001	MLM-001		
	Carbamate	SGS AXYS MLA-001	MLM-001		
	Carnosine	SGS AXYS MLA-001	MLM-001		
	Cinnamoylcarnoic acid	SGS AXYS MLA-001	MLM-001		
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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Serum
Choline	Choline	SGS AXYS MLM-001	MLM-001	Y	Alaska DEC ANAB DoD ** ANAB ISO 17025
Carnitine	Carnitine	SGS AXYS MLM-001	MLM-001	Y	CALA California WB Florida DOH Maine DOH Minnesota DOH New Jersey DEP New York DOH Virginia DGS Washington DE
Decadecylcarnitine	Decadecylcarnitine	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Decanoylcarnitine	Decanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y	CALA Florida DOH Maine DOH Minnesota DOH New Jersey DEP New York DOH Virginia DGS
Deoxycholic acid	Deoxycholic acid	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Dodecanoylcarnitine	Dodecanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Dodecylcarnitine	Dodecylcarnitine	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Dopamine	Dopamine	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Eicosapentaenoic acid (EPA)	Eicosapentaenoic acid (EPA)	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Eicosatetraenoic acid (arachidonic acid)	Eicosatetraenoic acid (arachidonic acid)	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Eicosatrienoic acid (linoleic acid)	Eicosatrienoic acid (linoleic acid)	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Glyceroxy carnitine	Glyceroxy carnitine	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Glutamate	Glutamate	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Glutaryl carnitine (Hydroxyhexanoylcarnitine)	Glutaryl carnitine (Hydroxyhexanoylcarnitine)	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Glycine	Glycine	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Glycochenodeoxycholic acid	Glycochenodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Glycocholic acid	Glycocholic acid	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Glycodeoxycholic acid	Glycodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Hexadeacetyl carnitine	Hexadeacetyl carnitine	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Hexadecanoic acid (palmitic acid)	Hexadecanoic acid (palmitic acid)	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Heptadecylcarnitine	Heptadecylcarnitine	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Heptadecenoylcarnitine	Heptadecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Heptadecylcarnitine (fumaryl carnitine)	Heptadecylcarnitine (fumaryl carnitine)	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Hexenoylcarnitine	Hexenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Hexose (sum isomers)	Hexose (sum isomers)	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Histamine	Histamine	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Heptadecylcarnitine	Heptadecylcarnitine	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Hydroxyheptadecenoylcarnitine	Hydroxyheptadecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Hydroxyheptadecenoylcarnitine C14:1	Hydroxyheptadecenoylcarnitine C14:1	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Hydroxysphingomyeline C16:1	Hydroxysphingomyeline C16:1	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Hydroxysphingomyeline C22:1	Hydroxysphingomyeline C22:1	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Hydroxysphingomyeline C24:1	Hydroxysphingomyeline C24:1	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Hydroxysphingomyeline C26:1	Hydroxysphingomyeline C26:1	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Hydroxystetradecenoylcarnitine	Hydroxystetradecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Hydroxystearoylcarnitine (Methylmalonylcarnitine)	Hydroxystearoylcarnitine (Methylmalonylcarnitine)	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Kynurenone	Kynurenone	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Leucine	Leucine	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Lithocholic acid	Lithocholic acid	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Lysine	Lysine	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
lysophosphatidylcholine acyl C14:0	lysophosphatidylcholine acyl C14:0	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
lysophosphatidylcholine acyl C16:0	lysophosphatidylcholine acyl C16:0	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
lysophosphatidylcholine acyl C16:1	lysophosphatidylcholine acyl C16:1	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
lysophosphatidylcholine acyl C17:0	lysophosphatidylcholine acyl C17:0	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
lysophosphatidylcholine acyl C18:0	lysophosphatidylcholine acyl C18:0	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
lysophosphatidylcholine acyl C18:1	lysophosphatidylcholine acyl C18:1	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
lysophosphatidylcholine acyl C18:2	lysophosphatidylcholine acyl C18:2	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
lysophosphatidylcholine acyl C20:3	lysophosphatidylcholine acyl C20:3	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Methionine	Methionine	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Methylglycine carnitine	Methylglycine carnitine	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Nicotinamide	Nicotinamide	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
Norvaline	Norvaline	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025
SGS AXYS MLM-001	SGS AXYS MLM-001	SGS AXYS MLM-001	MLM-001	Y	ANAB DoD ** ANAB ISO 17025

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Serum
	Phosphatidylserine diacyl C4:0:1	SGS AXYS MLA-001	MLA-001	Alaska DEC ANAB DoD ** ANAB ISO 17025	Solids
	Phosphatidylserine diacyl C4:0:2	SGS AXYS MLA-001	MLA-001	CALA	
	Phosphatidylserine diacyl C4:0:3	SGS AXYS MLA-001	MLA-001	California WB	
	Phosphatidylserine diacyl C4:0:4	SGS AXYS MLA-001	MLA-001	Florida DOH	
	Phosphatidylserine diacyl C4:0:5	SGS AXYS MLA-001	MLA-001	Maine DOH	
	Phosphatidylserine diacyl C4:0:6	SGS AXYS MLA-001	MLA-001	Minnesota DOH	
	Phosphatidylserine diacyl C4:2:0	SGS AXYS MLA-001	MLA-001	New Jersey DEP	
	Phosphatidylserine diacyl C4:2:1	SGS AXYS MLA-001	MLA-001	New York DOH	
	Phosphatidylserine diacyl C4:2:2	SGS AXYS MLA-001	MLA-001	Virginia DGS	
	Phosphatidylserine diacyl C4:2:4	SGS AXYS MLA-001	MLA-001	Washington DE	
	Phosphatidylserine diacyl C4:2:5	SGS AXYS MLA-001	MLA-001	ANAB DoD **	Tissue
	Phosphatidylserine diacyl C4:2:6	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Phimeloyamine	SGS AXYS MLA-001	MLA-001	CALA	Urine
	Proline	SGS AXYS MLA-001	MLA-001	CALA	Water
	Propionylcamitine	SGS AXYS MLA-001	MLA-001	Alaska DEC ANAB DoD ** ANAB ISO 17025	Water, Non-Potable
	Propionylcamitine	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	AFFF
	Putrescine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Sarcosine	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Serine	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Serotonin	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Spermidine	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Spermine	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Springamevine C16:0	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Springamevine C16:1	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Springamevine C18:0	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Springamevine C18:1	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Springamevine C20:2	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Springamevine C22:3	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Springamevine C24:0	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Springamevine C24:1	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Springamevine C26:0	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Springamevine C26:1	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Symmetric dimethylarginine	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Taurine	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Tauromechoketoholic acid	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Taurotropic acid	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Taurodeoxycholic acid	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Taurolithocholic acid	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Tauroxodeoxycholic acid	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Tetra-acetylmethylamine	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Tetradecanoic acid (myrist acid)	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Tetradecanoylcamitine	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Threonine	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Tiglycamidine	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Total methylnigamine	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Tryptophan	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Tyrosine	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Ursodeoxycholic acid	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Valericamidine	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
	Valine	SGS AXYS MLA-001	MLA-001	ANAB DoD ** ANAB ISO 17025	
TOP					
	Perflurobutanesulfonate (PFBS)	SGS AXYS MLA-111	MLA-111	ANAB DoD ** ANAB ISO 17025	
	Perflurobutanoate (PFBA)	SGS AXYS MLA-111	MLA-111	ANAB DoD ** ANAB ISO 17025	
	Perflurohexanesulfonate (PFHxS)	SGS AXYS MLA-111	MLA-111	ANAB DoD ** ANAB ISO 17025	
	Perflurohexanoate (PFHA)	SGS AXYS MLA-111	MLA-111	ANAB DoD ** ANAB ISO 17025	
	Perflurooctane (PFDA)	SGS AXYS MLA-111	MLA-111	ANAB DoD ** ANAB ISO 17025	
	Perflurooctanesulfonate (PFDS)	SGS AXYS MLA-111	MLA-111	ANAB DoD ** ANAB ISO 17025	
	Perflurooctanoate (PFDA)	SGS AXYS MLA-111	MLA-111	ANAB DoD ** ANAB ISO 17025	
	Perflurooctanesulfonate (PFHxS)	SGS AXYS MLA-111	MLA-111	ANAB DoD ** ANAB ISO 17025	
	Perflurooctanoate (PFNA)	SGS AXYS MLA-111	MLA-111	ANAB DoD ** ANAB ISO 17025	
	Perflurooctanesulfonate (PFOS)	SGS AXYS MLA-111	MLA-111	ANAB DoD ** ANAB ISO 17025	
	Perflurooctanoate (PFOA)	SGS AXYS MLA-111	MLA-111	ANAB DoD ** ANAB ISO 17025	
	Perfluroperfluorooctane (PFPeO)	SGS AXYS MLA-111	MLA-111	ANAB DoD ** ANAB ISO 17025	
	Perfluroperfluorooctane (PFPe)	SGS AXYS MLA-111	MLA-111	ANAB DoD ** ANAB ISO 17025	
	Perfluroperfluorooctane (PFPeA)	SGS AXYS MLA-111	MLA-111	ANAB DoD ** ANAB ISO 17025	
	Perflurooctadecane (PFUnA)	SGS AXYS MLA-111	MLA-111	ANAB DoD ** ANAB ISO 17025	
Note *	Analysis of PFASs in non-potable water samples by SGS AXYS method MLA-007, with the exception of NPDES or State permitted discharges and Stormwater applications, may fall within the scope of Washington State Department of Ecology solids matrix accreditation, subject to approval of the Ecology Project Manager.				

Compound Class	Compound	Note **	Accredited Method ID	SGS AXYS Method ID	
Y	Accreditation scope				
AFFF	Aqueous film forming foam				
BFR	Brominated flame retardants (non-PBDE)				
BPA and mPE	Bisphenol A and mono-Phthalate Esters				
OC Pesticides	Organochlorine Pesticides				
PAH	Polyaromatic Hydrocarbons				
PBDE	Polybrominated diphenyl ethers				
PCB	Polychlorinated Biphenyls				
PCDD/F	Polychlorinated dibenzodioxins/furans				
PFAS	Per- and Polyfluorinated Substances				
PPCP	Pharmaceutical and Personal Care Products				
TOP	Total Oxidizable Precursors				
California WB	California Water Boards, Lab ID 2911				
Florida DOH	Florida Department of Health, Lab ID EB71007, (NELAC Standard)				
Pennsylvania DEP	Pennsylvania Department of Environmental Protection				
Minnesota DOH	Minnesota Department of Health, Lab ID 232-999-4370, (NELAC Standard)				
New Jersey DEP	New Jersey Department of Environmental Protection, Lab ID CAN405, (NELAC Standard)				
New York DOH	New York Department of Health, Lab ID 11674, (NELAC Standard)				
Washington DE	Washington Department of Ecology, Lab ID 460224, (NELAC Standard)				
Virginia DGS	Virginia Department of General Services, Division of Consolidated Laboratory Services, Lab ID 17-014				
Alaska DEC	Alaska Department of Environmental Conservation, Contaminated Sites laboratory Approval 17-014				
Maine DOH	Maine Center for Disease Control and Prevention, Department of Health and Human Services, Lab ID CN00003				
CALA	Serum				
Alaska DEC	Solids				
ANAB DoD **					
ANAB ISO 17025					
CALA					
California WB					
Florida DOH					
Maine DOH					
Minnesota DOH					
New Jersey DEP					
New York DOH					
Virginia DGS					
Washington DE					
ANAB DoD **	Tissue				
ANAB ISO 17025					
CALA					
Florida DOH					
Minnesota DOH					
New Jersey DEP					
Virginia DGS					
CALA	Urine				
CALA	Water				
Alaska DEC	Water, Non-Potable				
ANAB DoD **					
ANAB ISO 17025					
CaliforniWB					
Florida DOH					
Maine DOH					
Minnesota DOH					
New Jersey DEP					
New York DOH					
Pennsylvania DEP					
Virginia DGS					
Washington DE *					
ANAB DoD **	AFFF				
ANAB ISO 17025					

ANAB DoD

ANSI National Accreditation Board, certificate ADE-1861, (US DoD QSM 5.3 Standard)

CALA

Canadian Association for Laboratory Accreditation Inc., Lab ID A2637, (ISO/IEC 17025:2017 Standard)



Testing
Accreditation No. A2637



2045 Mills Road West

TEL: (250) 655-5800

Sidney, BC, Canada V8L5X2

TOLL-FREE: 1-888-373-0881

SGS AXYS Client No.: 4066

Client Address: Tetra Tech, Inc. - Pacific Guardian Ctr.
 737 Bishop St., Suite 2340, Mauka Tower
 Honolulu, HI, US, 96813-3201

The SGS AXYS contact for these data is Dale Robinson.

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BATCH SUMMARY

Batch ID:	WG72537	Date:	21-Jul-2020
Analysis Type:	Perfluorinated Organic and FTS	Matrix Type:	Tissue

BATCH MAKEUP

Contract:	4066	Blank:	WG72537-101
Samples:	L33107-15 Site 5 Honolulu Harbor Fish #3 L33107-16 Site 7 Pearl Harbor Fish #1 L33107-17 Site 7 Pearl Harbor Fish #2 L33107-18 Site 7 Pearl Harbor Fish #3 L33107-19 Site 6 Ahuimanu Fiash #1 L33107-20 Site 6 Ahuimanu Fiash #2 L33107-21 Site 6 Ahuimanu Fiash #3 L33107-22 Site 10 K South Fish #1 L33107-23 Site 10 K South Fish #2 L33107-24 Site 10 K South Fish #3 L33107-25 Site 8 Hawaii Kai Fish #1 L33107-26 Site 8 Hawaii Kai Fish #2 L33107-27 Site 8 Hawaii Kai Fish #3 L33107-28 Site 12 Marine Corps Far Fish #1	Reference or Spike:	WG72537-102 WG72537-103
		Duplicate:	

Comments:

1. Data are considered final.
2. The analyte PFNA and PFUnA were detected in the Lab Blank (SGS AXYS ID: WG72537-101). Data are not blank corrected. Blank data should be taken into consideration when evaluating sample data.
3. Blank data should be evaluated against specifications using the same blank sample size as the size of the client samples.
4. Percent recovery of analyte N-EtFOSE in the OPR (SGS AXYS ID: WG72537-102) was below the method nominal limit and was flagged with an 'N'. Sample data may be similarly affected.
5. Percent recovery of several labeled compounds in several client samples and the CRM were outside the method nominal limit and were flagged with a 'V'. As the isotope dilution method of quantification produces data that are recovery corrected, the variances from the method acceptance criteria are deemed not to affect the quantification of the analytes. Percent labeled compound recoveries are used as a general method performance indicator only.



CHAIN OF CUSTODY

2045 Mills Road West TEL: (250) 655-5800 TOLL FREE 1-888-373-0881
 Sidney, British Columbia, Canada V8L 5X2 FAX: (250) 655-5811

SGS AXYS CLIENT #: 4066

REPORT TO:

Company Address		TO: Company Address		INVOICE		ANALYSIS REQUESTED	
Hawaii Pacific University	41-202 Kālamianole Hwy, Ste 9	Tera Tech, Inc. Honolulu	737 Bishop St., Suite 2340				
Waimanalo, HI 96795		Pacific Guardian Center, Mauka Tower	Honolulu, HI 96813-3201				
Contact	Jennifer Lynch	Contact	Eric Jensen				
Phone	808-236-3582 or 843-442-2188	Phone	808-441-4784				
FAX		FAX	808-536-3953				
E-mail	Jlynch@hpu.edu	E-mail	eric.jensen@tetratech.com				
Project Name/Number:	Perfluoroalkyl substance (PFAS) concentrations in fillets of nearshore Hawaiian reef fish caught in subsistence fisheries (HI DOH HPU)	Sampler's Name:	Natasha Sawickij				
Client Sample Identification	Sampling Date	Sampling Time	Container Type/No.	SGS AXYS Lab Sample ID (Lab use only)	MLA-110 (UPLC-MS/MS)		
Site 1 Kailua WWTP Fish #1	Matrix	Nov 3 2019	9:20 AM	50 mL PP tube	L33107-1	Fish Tissue samples	
Site 1 Kailua WWTP Fish #2	Homogenized fish muscle	Nov 3 2019	9:38 AM	50 mL PP tube	-2	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 1 Kailua WWTP Fish #3	Homogenized fish muscle	Nov 3 2019	11:25 AM	50 mL PP tube	-3	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 3 Ewa Beach Fish # 1	Homogenized fish muscle	Dec 15 2019	morning	50 mL PP tube	-4	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 3 Ewa Beach Fish # 2	Homogenized fish muscle	Feb 22 2020	morning	50 mL PP tube	-5	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 3 Ewa Beach Fish # 3	Homogenized fish muscle	Mar 21 2020	11:25 AM	50 mL PP tube	-6	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 4 Ala Wai Fish # 1	Homogenized fish muscle	Nov 15 2019	12:28 PM	50 mL PP tube	-7	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 4 Ala Wai Fish # 2	Homogenized fish muscle	Nov 15 2019	12:37 PM	50 mL PP tube	-8	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 4 Ala Wai Fish # 3	Homogenized fish muscle	Nov 15 2019	12:44 PM	50 mL PP tube	-9	MLA-110 (UPLC-MS/MS)	Fish Tissue samples

received by: Jennifer Lynch

20 May 2020

10:35

Site 9 Bellows Fish #1	Homogenized fish muscle	Feb 23 2020	11:30 AM	50 mL PP tube	L33107-10	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 9 Bellows Fish #2	Homogenized fish muscle	Feb 23 2020	11:30 AM	50 mL PP tube	-11	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 9 Bellows Fish #3	Homogenized fish muscle	Mar 22 2020	Morning	50 mL PP tube	-12	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 5 Honolulu Harbor Fish #1	Homogenized fish muscle	Nov 15 2019	2:35 PM	50 mL PP tube	-13	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 5 Honolulu Harbor Fish #2	Homogenized fish muscle	Nov 15 2019	2:40PM	50 mL PP tube	-14	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 5 Honolulu Harbor Fish #3	Homogenized fish muscle	Dec 15 2019	2:40PM	50 mL PP tube	-15	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 7 Pearl Harbor Fish #1	Homogenized fish muscle	Feb 22 2020	1:30 PM	50 mL PP tube	-16	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 7 Pearl Harbor Fish #2	Homogenized fish muscle	Feb 22 2020	1:30 PM	50 mL PP tube	-17	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 7 Pearl Harbor Fish #3	Homogenized fish muscle	Feb 22 2020	2:00 PM	50 mL PP tube	-18	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 6 Ahuimanu Fish #1	Homogenized fish muscle	Mar 12 2020	10:45 AM	50 mL PP tube	-19	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 6 Ahuimanu Fish #2	Homogenized fish muscle	Mar 12 2020	10:55 AM	50 mL PP tube	-20	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 6 Ahuimanu Fish #3	Homogenized fish muscle	Apr 11 2020	10:15 AM	50 mL PP tube	-21	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 10 K South Fish #1	Homogenized fish muscle	Mar 3 2020	2:10 PM	50 mL PP tube	-22	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 10 K South Fish #2	Homogenized fish muscle	Mar 3 2020	2:15 PM	50 mL PP tube	-23	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 10 K South Fish #3	Homogenized fish muscle	Mar 3 2020	2:20 PM	50 mL PP tube	-24	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 8 Hawaii Kai Fish #1	Homogenized fish muscle	Apr 13 2020	9:00 PM	50 mL PP tube	-25	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 8 Hawaii Kai Fish #2	Homogenized fish muscle	Apr 13 2020	9:00 PM	50 mL PP tube	-26	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 8 Hawaii Kai Fish #3	Homogenized fish muscle	Apr 13 2020	9:00 PM	50 mL PP tube	-27	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 12 Marine Corps Far Fish #1	Homogenized fish muscle	Mar 12 2020	12:50 PM	50 mL PP tube	-28	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 12 Marine Corps Far Fish #2	Homogenized fish muscle	Apr 11 2020	9:20 AM	50 mL PP tube	-29	MLA-110 (UPLC-MS/MS) Fish Tissue samples

Received by: Jennifer Carlson 20 May 2020 10:35

Site 12 Marine Corps Far Fish #3	Homogenized fish muscle	Apr 11 2020	9:30 AM	50 mL PP tube	L 33107 - 30	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 11 Landfill Fish #1	Homogenized fish muscle	Mar 3 2020	4:25 PM	50 mL PP tube	- 31	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 11 Landfill Fish #2	Homogenized fish muscle	Apr 29 2020	1:00 PM	50 mL PP tube	- 32	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 11 Landfill Fish #3	Homogenized fish muscle	Apr 29 2020	12:10 PM	50 mL PP tube	- 33	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 13 K North Fish #1	Homogenized fish muscle	May 7 2020	10:40 AM	50 mL PP tube	- 34	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 13 K North Fish #2	Homogenized fish muscle	May 7 2020	10:50 AM	50 mL PP tube	- 35	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 13 K North Fish #3	Homogenized fish muscle	May 7 2020	10:40 AM	50 mL PP tube	- 36	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 14 Kahuku Fish #1	Homogenized fish muscle	May 13 2020	11:07 AM	50 mL PP tube	- 37	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 14 Kahuku Fish #2	Homogenized fish muscle	May 13 2020	12:15 PM	50 mL PP tube	- 38	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 14 Kahuku Fish #3	Homogenized fish muscle	May 13 2020	10:45 AM	50 mL PP tube	- 39	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 15 Haleiwa Fish #1	Homogenized fish muscle	May 7 2020	1:50 PM	50 mL PP tube	- 40	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 15 Haleiwa Fish #2	Homogenized fish muscle	May 7 2020	1:55 PM	50 mL PP tube	- 41	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 15 Haleiwa Fish #3	Homogenized fish muscle	May 7 2020	2:00 PM	50 mL PP tube	- 42	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Fish Field Blank 1	Deionized water	Apr 29 2020	morning	50 mL PP tube	L 33105 - 1	MLA-110 (UPLC-MS/MS) Water samples
Fish Field Blank 2	Deionized water	May 7 2020	morning	50 mL PP tube	- 2	MLA-110 (UPLC-MS/MS) Water samples
Fish Field Blank 3	Deionized water	May 13 2020	11:27 AM	50 mL PP tube	- 3	MLA-110 (UPLC-MS/MS) Water samples
Relinquished by (Signature) <i>Jennifer Lynch</i>	Date <u>May 13-2020</u> Time <u>10:35</u>	Received by (Signature) <u>Tonya Andersen</u>	Courier <u>FedEx</u>	Sample Receipt	Wavbill No. <u>see email</u>	
Remarks	Date	Time			Temp °C	Cooler
					Custody Seal #	

SGS AXYS METHOD MLA-110 Rev 02
**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**
CLIENT SAMPLE NO.
Site 5 Honolulu Harbor Fish #3
Sample Collection:
15-Dec-2019 14:40
SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-15		
Matrix:	TISSUE	Sample Size:	2.02 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 04:19:16	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 28
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.792 (L)	
PFPeA	U		0.396 (L)	
PFHxA	U		0.198 (L)	
PFHpA	U		0.198 (L)	
PFOA	U		0.198 (L)	
PFNA	U		0.198 (L)	
PFDA	U		0.198 (L)	
PFUnA	U		0.198 (L)	
PFDoA	U		0.198 (L)	
PFTrDA	U		0.198 (L)	
PFTeDA	U		0.198 (L)	
PFBS	U		0.198 (L)	
PFPeS	U		0.198 (L)	
PFHxS	U		0.198 (L)	
PFHpS	U		0.198 (L)	
PFOS	U		0.198 (L)	
PFNS	U		0.198 (L)	
PFDS	U		0.198 (L)	
PFDoS	U H		0.198 (L)	
4:2 FTS	U		0.792 (L)	
6:2 FTS	U		0.713 (L)	
8:2 FTS	U		0.792 (L)	
PFOSA	U		0.198 (L)	
N-MeFOSA	U		0.228 (L)	
N-EtFOSA	U		0.495 (L)	
MeFOSAA	U		0.198 (L)	
EtFOSAA	U		0.198 (L)	
N-MeFOSE	U H		1.98 (L)	
N-EtFOSE	U		1.49 (L)	
HFPO-DA	U		0.752 (L)	
ADONA	U		0.792 (L)	
9CI-PF3ONS	U		0.792 (L)	
11CI-PF3OUDS	U		0.792 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 5 Honolulu Harbor Fish #3
Sample Collection:
15-Dec-2019 14:40

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-15
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 04:19:16	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 28
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	35.6	88.9	1:49
13C5-PFPeA		20.0	20.8	104	4:24
13C5-PFHxA		10.0	9.68	96.8	5:00
13C4-PFHxA		10.0	9.01	90.1	5:28
13C8-PFOA		10.0	9.13	91.3	6:10
13C9-PFNA		5.00	4.37	87.4	7:01
13C6-PFDA		5.00	4.63	92.6	7:33
13C7-PFUuA		5.00	4.57	91.4	7:52
13C2-PFDuA		5.00	4.38	87.5	8:07
13C2-PFTeDA		5.00	3.72	74.5	8:49
13C3-PFBS		10.0	9.67	96.7	4:58
13C3-PFHxA		10.0	9.15	91.5	6:16
13C8-PFOS		10.0	10.1	101	7:38
13C2-4:2 FTS		20.0	24.6	123	4:53
13C2-6:2 FTS		20.0	16.3	81.5	5:52
13C2-8:2 FTS		20.0	20.1	101	7:22
13C8-PFOSA		10.0	10.9	109	8:43
D3-N-MeFOSA		10.0	6.15	61.5	10:09
D5-N-EtFOSA		10.0	6.18	61.8	10:27
D3-MeFOSAA		20.0	22.9	114	7:36
D5-EtFOSAA		20.0	24.9	124	7:44
d7-NMe-FOSE		100	6.72	6.72	10:01
d9-NEt-FOSE		100	45.0	45.0	10:19
13C3-HFPO-DA		40.0	35.3	88.3	5:09

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-15_Form2_FC0L_206S28_SJ2757454.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02
**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**
**CLIENT SAMPLE NO.
Site 7 Pearl Harbor Fish #1
Sample Collection:
22-Feb-2020 13:30**
SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 04:32:21	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 29
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.780 (L)	
PFPeA	U		0.390 (L)	
PFHxA	U		0.195 (L)	
PFHpA	U		0.195 (L)	
PFOA	U		0.195 (L)	
PFNA	U		0.195 (L)	
PFDA	U		0.195 (L)	
PFUnA	U		0.195 (L)	
PFDoA	U		0.195 (L)	
PFTrDA	U		0.195 (L)	
PFTeDA	U		0.195 (L)	
PFBS	U		0.195 (L)	
PFPeS	U		0.195 (L)	
PFHxS	U		0.195 (L)	
PFHpS	U		0.195 (L)	
PFOS		0.719	0.195 (L)	
PFNS	U		0.195 (L)	
PFDS	U		0.195 (L)	
PFDoS	U H		0.195 (L)	
4:2 FTS	U		0.780 (L)	
6:2 FTS	U		0.702 (L)	
8:2 FTS	U		0.780 (L)	
PFOSA	U		0.195 (L)	
N-MeFOSA	U		0.224 (L)	
N-EtFOSA	U		0.488 (L)	
MeFOSAA	U		0.195 (L)	
EtFOSAA	U		0.195 (L)	
N-MeFOSE	U H		1.95 (L)	
N-EtFOSE	U		1.46 (L)	
HFPO-DA	U		0.741 (L)	
ADONA	U		0.780 (L)	
9CI-PF3ONS	U		0.780 (L)	
11CI-PF3OUDS	U		0.780 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 7 Pearl Harbor Fish #1
Sample Collection:
22-Feb-2020 13:30

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-16
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 04:32:21	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 29
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	35.5	88.7	1:49
13C5-PFPeA		20.0	20.8	104	4:24
13C5-PFHxA		10.0	9.89	98.9	5:00
13C4-PFHxA		10.0	8.94	89.4	5:28
13C8-PFOA		10.0	9.11	91.1	6:10
13C9-PFNA		5.00	4.37	87.5	7:01
13C6-PFDA		5.00	5.22	104	7:32
13C7-PFUuA		5.00	4.87	97.4	7:52
13C2-PFDuA		5.00	4.96	99.2	8:07
13C2-PFTeDA		5.00	3.86	77.2	8:48
13C3-PFBS		10.0	8.99	89.9	4:58
13C3-PFHxA		10.0	9.23	92.3	6:16
13C8-PFOS		10.0	10.1	101	7:38
13C2-4:2 FTS		20.0	26.3	132	4:53
13C2-6:2 FTS		20.0	17.4	87.0	5:52
13C2-8:2 FTS		20.0	20.6	103	7:22
13C8-PFOSA		10.0	11.0	110	8:43
D3-N-MeFOSA		10.0	6.53	65.3	10:09
D5-N-EtFOSA		10.0	6.22	62.2	10:27
D3-MeFOSAA		20.0	22.6	113	7:35
D5-EtFOSAA		20.0	24.4	122	7:43
d7-NMe-FOSE		100	7.35	7.35	10:01
d9-NEt-FOSE		100	60.1	60.1	10:19
13C3-HFPO-DA		40.0	36.6	91.6	5:09

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-16_Form2_FC0L_206S29_SJ2757455.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 7 Pearl Harbor Fish #2
Sample Collection:
22-Feb-2020 13:30

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 04:45:18	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 30
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG¹	CONC. FOUND	REPORTING LIMIT (RL)²	RETENTION TIME
PFBA	U		0.784 (L)	
PFPeA	U		0.392 (L)	
PFHxA	U		0.196 (L)	
PFHpA	U		0.196 (L)	
PFOA	U		0.196 (L)	
PFNA	U		0.196 (L)	
PFDA	U		0.196 (L)	
PFUnA	U		0.196 (L)	
PFDoA	U		0.196 (L)	
PFTrDA	U		0.196 (L)	
PFTeDA	U		0.196 (L)	
PFBS	U		0.196 (L)	
PFPeS	U		0.196 (L)	
PFHxS	U		0.196 (L)	
PFHpS	U		0.196 (L)	
PFOS		0.558	0.196 (L)	
PFNS	U		0.196 (L)	
PFDS	U		0.196 (L)	
PFDoS	U H		0.196 (L)	
4:2 FTS	U		0.784 (L)	
6:2 FTS	J	0.842	0.706 (L)	5:52
8:2 FTS	U		0.784 (L)	
PFOSA	U		0.196 (L)	
N-MeFOSA	U		0.225 (L)	
N-EtFOSA	U		0.490 (L)	
MeFOSAA	U		0.196 (L)	
EtFOSAA	U		0.196 (L)	
N-MeFOSE	U H		1.96 (L)	
N-EtFOSE	U		1.47 (L)	
HFPO-DA	U		0.745 (L)	
ADONA	U		0.784 (L)	
9CI-PF3ONS	U		0.784 (L)	
11CI-PF3OUdS	U		0.784 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; J = concentration less than limit of quantification; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonso _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 7 Pearl Harbor Fish #2
Sample Collection:
22-Feb-2020 13:30

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-17
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 04:45:18	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 30
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	35.5	88.8	1:49
13C5-PFPeA		20.0	28.1	141	4:24
13C5-PFHxA		10.0	9.53	95.3	5:00
13C4-PFHxA		10.0	9.10	91.0	5:28
13C8-PFOA		10.0	8.87	88.7	6:10
13C9-PFNA		5.00	4.30	86.0	7:01
13C6-PFDA		5.00	4.46	89.1	7:32
13C7-PFUuA		5.00	4.49	89.8	7:52
13C2-PFDuA		5.00	4.12	82.4	8:07
13C2-PFTeDA		5.00	3.80	76.1	8:48
13C3-PFBS		10.0	7.49	74.9	4:58
13C3-PFHxA		10.0	8.96	89.6	6:16
13C8-PFOS		10.0	9.75	97.5	7:38
13C2-4:2 FTS		20.0	28.4	142	4:53
13C2-6:2 FTS		20.0	21.1	106	5:52
13C2-8:2 FTS		20.0	24.7	123	7:22
13C8-PFOSA		10.0	11.6	116	8:43
D3-N-MeFOSA		10.0	7.14	71.4	10:09
D5-N-EtFOSA		10.0	5.94	59.4	10:26
D3-MeFOSAA		20.0	25.0	125	7:35
D5-EtFOSAA		20.0	29.4	147	7:43
d7-NMe-FOSE		100	7.36	7.36	10:01
d9-NEt-FOSE		100	53.8	53.8	10:19
13C3-HFPO-DA		40.0	47.5	119	5:09

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-17_Form2_FC0L_206S30_SJ2757456.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02
**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**
**CLIENT SAMPLE NO.
Site 7 Pearl Harbor Fish #3
Sample Collection:
22-Feb-2020 14:00**
SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-18		
Matrix:	TISSUE	Sample Size:	2.01 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 04:58:23	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 31
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.796 (L)	
PFPeA	U		0.398 (L)	
PFHxA	U		0.199 (L)	
PFHpA	U		0.199 (L)	
PFOA	U		0.199 (L)	
PFNA	U		0.199 (L)	
PFDA	U		0.199 (L)	
PFUnA	U		0.199 (L)	
PFDoA	U		0.199 (L)	
PFTrDA	U		0.199 (L)	
PFTeDA	U		0.199 (L)	
PFBS	U		0.199 (L)	
PFPeS	U		0.199 (L)	
PFHxS	U		0.199 (L)	
PFHpS	U		0.199 (L)	
PFOS		0.667	0.199 (L)	
PFNS	U		0.199 (L)	
PFDS	U		0.199 (L)	
PFDoS	U H		0.199 (L)	
4:2 FTS	U		0.796 (L)	
6:2 FTS	J	0.824	0.716 (L)	5:52
8:2 FTS	U		0.796 (L)	
PFOSA	U		0.199 (L)	
N-MeFOSA	U		0.229 (L)	
N-EtFOSA	U		0.498 (L)	
MeFOSAA	U		0.199 (L)	
EtFOSAA	U		0.199 (L)	
N-MeFOSE	U H		1.99 (L)	
N-EtFOSE	U		1.49 (L)	
HFPO-DA	U		0.756 (L)	
ADONA	U		0.796 (L)	
9CI-PF3ONS	U		0.796 (L)	
11CI-PF3OUdS	U		0.796 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; J = concentration less than limit of quantification; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonso _____

For Axys Internal Use Only [XSL Template: FC-Form1A.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
 Report Filename: PFC_FC_LC_PFAS_L33107-18_Form1A_FC0L_206S31_SJ2757457.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 7 Pearl Harbor Fish #3
Sample Collection:
22-Feb-2020 14:00

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-18
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 04:58:23	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 31
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	34.9	87.1	1:49
13C5-PFPeA	V	20.0	32.6	163	4:24
13C5-PFHxA		10.0	9.52	95.2	5:00
13C4-PFHxA		10.0	9.10	91.0	5:27
13C8-PFOA		10.0	8.73	87.3	6:10
13C9-PFNA		5.00	4.33	86.6	7:01
13C6-PFDA		5.00	4.20	84.0	7:32
13C7-PFUuA		5.00	4.02	80.5	7:52
13C2-PFDuA		5.00	4.00	79.9	8:07
13C2-PFTeDA		5.00	3.30	66.1	8:49
13C3-PFBS		10.0	7.46	74.6	4:58
13C3-PFHxA		10.0	8.89	88.9	6:16
13C8-PFOS		10.0	10.1	101	7:38
13C2-4:2 FTS		20.0	27.7	139	4:53
13C2-6:2 FTS		20.0	20.5	103	5:52
13C2-8:2 FTS		20.0	26.4	132	7:22
13C8-PFOSA		10.0	11.6	116	8:43
D3-N-MeFOSA		10.0	5.90	59.0	10:09
D5-N-EtFOSA		10.0	5.39	53.9	10:26
D3-MeFOSAA		20.0	26.4	132	7:35
D5-EtFOSAA		20.0	28.7	143	7:43
d7-NMe-FOSE		100	7.52	7.52	10:01
d9-NEt-FOSE		100	55.0	55.0	10:19
13C3-HFPO-DA		40.0	58.3	146	5:09

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-18_Form2_FC0L_206S31_SJ2757457.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02
Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT
CLIENT SAMPLE NO.
Site 6 Ahuimanu Fiash #1
Sample Collection:
12-Mar-2020 10:45
SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 05:11:20	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 32
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG¹	CONC. FOUND	REPORTING LIMIT (RL)²	RETENTION TIME
PFBA	U		0.784 (L)	
PFPeA	U		0.392 (L)	
PFHxA	U		0.196 (L)	
PFHpA	U		0.196 (L)	
PFOA	U		0.196 (L)	
PFNA	U		0.196 (L)	
PFDA	U		0.196 (L)	
PFUnA	U		0.196 (L)	
PFDoA	U		0.196 (L)	
PFTrDA	U		0.196 (L)	
PFTeDA	U		0.196 (L)	
PFBS	U		0.196 (L)	
PFPeS	U		0.196 (L)	
PFHxS	U		0.196 (L)	
PFHpS	U		0.196 (L)	
PFOS	J	0.229	0.196 (L)	
PFNS	U		0.196 (L)	
PFDS	U		0.196 (L)	
PFDoS	U H		0.196 (L)	
4:2 FTS	U		0.784 (L)	
6:2 FTS	U		0.706 (L)	
8:2 FTS	U		0.784 (L)	
PFOSA	U		0.196 (L)	
N-MeFOSA	U		0.225 (L)	
N-EtFOSA	U		0.490 (L)	
MeFOSAA	U		0.196 (L)	
EtFOSAA	U		0.196 (L)	
N-MeFOSE	U H		1.96 (L)	
N-EtFOSE	U		1.47 (L)	
HFPO-DA	U		0.745 (L)	
ADONA	U		0.784 (L)	
9CI-PF3ONS	U		0.784 (L)	
11CI-PF3OUdS	U		0.784 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; J = concentration less than limit of quantification; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonso _____

For Axys Internal Use Only [XSL Template: FC-Form1A.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
 Report Filename: PFC_FC_LC_PFAS_L33107-19_Form1A_FC0L_206S32_SJ2757458.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 6 Ahuimanu Fiash #1
Sample Collection:
12-Mar-2020 10:45

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-19
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 05:11:20	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 32
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	37.3	93.2	1:49
13C5-PFPeA	V	20.0	37.3	187	4:24
13C5-PFHxA		10.0	10.4	104	5:00
13C4-PFHxA		10.0	9.44	94.4	5:28
13C8-PFOA		10.0	9.07	90.7	6:10
13C9-PFNA		5.00	4.50	89.9	7:01
13C6-PFDA		5.00	5.19	104	7:32
13C7-PFUuA		5.00	4.95	99.1	7:52
13C2-PFDuA		5.00	4.81	96.2	8:07
13C2-PFTeDA		5.00	4.10	82.0	8:49
13C3-PFBs		10.0	7.22	72.2	4:58
13C3-PFHxA		10.0	9.72	97.2	6:16
13C8-PFOS		10.0	10.2	102	7:38
13C2-4:2 FTS		20.0	27.1	136	4:53
13C2-6:2 FTS		20.0	19.8	99.2	5:52
13C2-8:2 FTS		20.0	28.0	140	7:22
13C8-PFOSA		10.0	11.6	116	8:43
D3-N-MeFOSA		10.0	7.57	75.7	10:09
D5-N-EtFOSA		10.0	7.39	73.9	10:26
D3-MeFOSAA		20.0	27.6	138	7:36
D5-EtFOSAA		20.0	29.6	148	7:44
d7-NMe-FOSE		100	7.59	7.59	10:01
d9-NEt-FOSE		100	90.3	90.3	10:19
13C3-HFPO-DA	V	40.0	69.2	173	5:09

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

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Report Filename: PFC_FC_LC_PFAS_L33107-19_Form2_FC0L_206S32_SJ2757458.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02
**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**
**CLIENT SAMPLE NO.
Site 6 Ahuimanu Fiash #2
Sample Collection:
12-Mar-2020 10:55**
SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS
Lab Sample I.D.:	L33107-20
Matrix:	TISSUE
Sample Size:	2.06 g (wet)
Sample Receipt Date:	20-May-2020
Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020
Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 05:24:25
Column ID:	C18
Extract Volume (uL):	4000
Sample Data Filename:	FC0L_206 S: 33
Injection Volume (uL):	2
Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A
Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng/g (wet weight basis)

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.777 (L)	
PFPeA	U		0.388 (L)	
PFHxA	U		0.194 (L)	
PFHpA	U		0.194 (L)	
PFOA	U		0.194 (L)	
PFNA	U		0.194 (L)	
PFDA	U		0.194 (L)	
PFUnA	U		0.194 (L)	
PFDoA	U		0.194 (L)	
PFTrDA	U		0.194 (L)	
PFTeDA	U		0.194 (L)	
PFBS	U		0.194 (L)	
PFPeS	U		0.194 (L)	
PFHxS	U		0.194 (L)	
PFHpS	U		0.194 (L)	
PFOS	J	0.262	0.194 (L)	
PFNS	U		0.194 (L)	
PFDS	U		0.194 (L)	
PFDoS	U H		0.194 (L)	
4:2 FTS	U		0.777 (L)	
6:2 FTS	U		0.699 (L)	
8:2 FTS	U		0.777 (L)	
PFOSA	U		0.194 (L)	
N-MeFOSA	U		0.223 (L)	
N-EtFOSA	U		0.485 (L)	
MeFOSAA	U		0.194 (L)	
EtFOSAA	U		0.194 (L)	
N-MeFOSE	U H		1.94 (L)	
N-EtFOSE	U		1.46 (L)	
HFPO-DA	U		0.738 (L)	
ADONA	U		0.777 (L)	
9CI-PF3ONS	U		0.777 (L)	
11CI-PF3OUdS	U		0.777 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; J = concentration less than limit of quantification; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonso _____

For Axys Internal Use Only [XSL Template: FC-Form1A.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
 Report Filename: PFC_FC_LC_PFAS_L33107-20_Form1A_FC0L_206S33_SJ2757459.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 6 Ahuimanu Fiash #2
Sample Collection:
12-Mar-2020 10:55

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-20
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 05:24:25	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 33
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	35.8	89.6	1:49
13C5-PFPeA		20.0	24.6	123	4:24
13C5-PFHxA		10.0	9.61	96.1	5:00
13C4-PFHxA		10.0	9.95	99.5	5:28
13C8-PFOA		10.0	9.98	99.8	6:10
13C9-PFNA		5.00	4.44	88.8	7:01
13C6-PFDA		5.00	4.87	97.5	7:32
13C7-PFUuA		5.00	4.58	91.5	7:52
13C2-PFDuA		5.00	4.77	95.4	8:07
13C2-PFTeDA		5.00	3.84	76.8	8:48
13C3-PFBS		10.0	8.26	82.6	4:58
13C3-PFHxS		10.0	9.32	93.2	6:16
13C8-PFOS		10.0	10.0	100	7:38
13C2-4:2 FTS		20.0	29.5	148	4:53
13C2-6:2 FTS		20.0	19.5	97.6	5:52
13C2-8:2 FTS		20.0	26.5	132	7:22
13C8-PFOSA		10.0	12.0	120	8:43
D3-N-MeFOSA		10.0	7.94	79.4	10:09
D5-N-EtFOSA		10.0	6.76	67.6	10:26
D3-MeFOSAA		20.0	24.7	124	7:35
D5-EtFOSAA		20.0	29.2	146	7:44
d7-NMe-FOSE		100	7.75	7.75	10:00
d9-NEt-FOSE		100	73.7	73.7	10:19
13C3-HFPO-DA		40.0	47.3	118	5:09

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-20_Form2_FC0L_206S33_SJ2757459.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**

CLIENT SAMPLE NO.
Site 6 Ahuimanu Fiash #3
Sample Collection:
11-Apr-2020 10:15

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS
Lab Sample I.D.:	L33107-21
Matrix: TISSUE	Sample Size: 2.08 g (wet)
Sample Receipt Date: 20-May-2020	Initial Calibration Date: 18-Mar-2020
Extraction Date: 22-Jun-2020	Instrument ID: LCMS/MS
Analysis Date: 25-Jun-2020 Time: 05:37:22	Column ID: C18
Extract Volume (uL): 4000	Sample Data Filename: FC0L_206 S: 34
Injection Volume (uL): 2	Blank Data Filename: FC0L_206 S: 27
Dilution Factor: N/A	Cal. Ver. Data Filename: FC0L_206 S: 22
Concentration Units: ng/g (wet weight basis)	

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.769 (L)	
PFPeA	U		0.385 (L)	
PFHxA	U		0.192 (L)	
PFHpA	U		0.192 (L)	
PFOA	U		0.192 (L)	
PFNA	U		0.192 (L)	
PFDA	U		0.192 (L)	
PFUnA	U		0.192 (L)	
PFDoA	U		0.192 (L)	
PFTrDA	U		0.192 (L)	
PFTeDA	U		0.192 (L)	
PFBS	U		0.192 (L)	
PFPeS	U		0.192 (L)	
PFHxS	U		0.192 (L)	
PFHpS	U		0.192 (L)	
PFOS		0.632	0.192 (L)	
PFNS	U		0.192 (L)	
PFDS	U		0.192 (L)	
PFDoS	U H		0.192 (L)	
4:2 FTS	U		0.769 (L)	
6:2 FTS	U		0.692 (L)	
8:2 FTS	U		0.769 (L)	
PFOSA	U		0.192 (L)	
N-MeFOSA	U		0.221 (L)	
N-EtFOSA	U		0.481 (L)	
MeFOSAA	U		0.192 (L)	
EtFOSAA	U		0.192 (L)	
N-MeFOSE	U H		1.92 (L)	
N-EtFOSE	U		1.44 (L)	
HFPO-DA	U		0.731 (L)	
ADONA	U		0.769 (L)	
9CI-PF3ONS	U		0.769 (L)	
11CI-PF3OUDS	U		0.769 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 6 Ahuimanu Fiash #3
Sample Collection:
11-Apr-2020 10:15

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-21
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 05:37:22	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 34
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	30.2	75.5	1:49
13C5-PFPeA		20.0	28.8	144	4:24
13C5-PFHxA		10.0	8.06	80.6	5:00
13C4-PFHxA		10.0	7.68	76.8	5:28
13C8-PFOA		10.0	7.99	79.9	6:10
13C9-PFNA		5.00	3.74	74.9	7:01
13C6-PFDA		5.00	4.02	80.5	7:32
13C7-PFUuA		5.00	3.82	76.4	7:52
13C2-PFDuA		5.00	3.54	70.7	8:07
13C2-PFTeDA		5.00	2.76	55.2	8:48
13C3-PFBs		10.0	5.02	50.2	4:58
13C3-PFHxA		10.0	7.44	74.4	6:16
13C8-PFOS		10.0	8.21	82.1	7:38
13C2-4:2 FTS		20.0	19.8	99.2	4:53
13C2-6:2 FTS		20.0	16.4	82.1	5:52
13C2-8:2 FTS		20.0	20.5	103	7:22
13C8-PFOSA		10.0	10.1	101	8:43
D3-N-MeFOSA		10.0	5.92	59.2	10:09
D5-N-EtFOSA		10.0	4.56	45.6	10:26
D3-MeFOSAA		20.0	21.2	106	7:35
D5-EtFOSAA		20.0	24.5	123	7:43
d7-NMe-FOSE		100	6.28	6.28	10:00
d9-NEt-FOSE		100	47.2	47.2	10:19
13C3-HFPO-DA		40.0	49.3	123	5:09

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-21_Form2_FC0L_206S34_SJ2757460.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 10 K South Fish #1
Sample Collection:
03-Mar-2020 14:10

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-22		
Matrix:	TISSUE	Sample Size:	2.02 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 05:50:27	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 35
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.792 (L)	
PFPeA	U		0.396 (L)	
PFHxA	U		0.198 (L)	
PFHpA	U		0.198 (L)	
PFOA	U		0.198 (L)	
PFNA	U		0.198 (L)	
PFDA	U		0.198 (L)	
PFUnA	U		0.198 (L)	
PFDoA	U		0.198 (L)	
PFTrDA	U		0.198 (L)	
PFTeDA	U		0.198 (L)	
PFBS	U		0.198 (L)	
PFPeS	U		0.198 (L)	
PFHxS	U		0.198 (L)	
PFHpS	U		0.198 (L)	
PFOS	U		0.198 (L)	
PFNS	U		0.198 (L)	
PFDS	U		0.198 (L)	
PFDoS	U H		0.198 (L)	
4:2 FTS	U		0.792 (L)	
6:2 FTS	U		0.713 (L)	
8:2 FTS	U		0.792 (L)	
PFOSA	U		0.198 (L)	
N-MeFOSA	U		0.228 (L)	
N-EtFOSA	U		0.495 (L)	
MeFOSAA	U		0.198 (L)	
EtFOSAA	U		0.198 (L)	
N-MeFOSE	U H		1.98 (L)	
N-EtFOSE	U		1.49 (L)	
HFPO-DA	U		0.752 (L)	
ADONA	U		0.792 (L)	
9CI-PF3ONS	U		0.792 (L)	
11CI-PF3OUDS	U		0.792 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 10 K South Fish #1
Sample Collection:
03-Mar-2020 14:10

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-22
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 05:50:27	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 35
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	36.3	90.8	1:49
13C5-PFPeA		20.0	29.3	147	4:24
13C5-PFHxA		10.0	9.86	98.6	5:00
13C4-PFHxA		10.0	9.87	98.7	5:28
13C8-PFOA		10.0	9.52	95.2	6:10
13C9-PFNA		5.00	4.51	90.1	7:01
13C6-PFDA		5.00	4.79	95.9	7:32
13C7-PFUuA		5.00	4.77	95.4	7:52
13C2-PFDuA		5.00	4.55	91.1	8:07
13C2-PFTeDA		5.00	3.59	71.9	8:49
13C3-PFBS		10.0	7.86	78.6	4:58
13C3-PFHxA		10.0	9.48	94.8	6:16
13C8-PFOS		10.0	10.9	109	7:38
13C2-4:2 FTS		20.0	26.3	131	4:53
13C2-6:2 FTS		20.0	18.4	92.2	5:53
13C2-8:2 FTS		20.0	24.6	123	7:22
13C8-PFOSA		10.0	12.7	127	8:43
D3-N-MeFOSA		10.0	7.09	70.9	10:09
D5-N-EtFOSA		10.0	6.89	68.9	10:26
D3-MeFOSAA		20.0	24.5	123	7:35
D5-EtFOSAA		20.0	27.5	137	7:44
d7-NMe-FOSE		100	7.42	7.42	10:01
d9-NEt-FOSE		100	95.0	95.0	10:19
13C3-HFPO-DA		40.0	55.6	139	5:09

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-22_Form2_FC0L_206S35_SJ2757461.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02
**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**
**CLIENT SAMPLE NO.
Site 10 K South Fish #2
Sample Collection:
03-Mar-2020 14:15**
SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS
Lab Sample I.D.:	L33107-23
Matrix:	TISSUE
Sample Size:	2.09 g (wet)
Sample Receipt Date:	20-May-2020
Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020
Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 06:03:24
Column ID:	C18
Extract Volume (uL):	4000
Sample Data Filename:	FC0L_206 S: 36
Injection Volume (uL):	2
Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A
Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng/g (wet weight basis)

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.766 (L)	
PFPeA	U		0.383 (L)	
PFHxA	U		0.191 (L)	
PFHpA	U		0.191 (L)	
PFOA	U		0.191 (L)	
PFNA	U		0.191 (L)	
PFDA	U		0.191 (L)	
PFUnA	U		0.191 (L)	
PFDoA	U		0.191 (L)	
PFTrDA	U		0.191 (L)	
PFTeDA	U		0.191 (L)	
PFBS	U		0.191 (L)	
PFPeS	U		0.191 (L)	
PFHxS	U		0.191 (L)	
PFHpS	U		0.191 (L)	
PFOS	U		0.191 (L)	
PFNS	U		0.191 (L)	
PFDS	U		0.191 (L)	
PFDoS	U H		0.191 (L)	
4:2 FTS	U		0.766 (L)	
6:2 FTS	U		0.689 (L)	
8:2 FTS	U		0.766 (L)	
PFOSA	U		0.191 (L)	
N-MeFOSA	U		0.220 (L)	
N-EtFOSA	U		0.478 (L)	
MeFOSAA	U		0.191 (L)	
EtFOSAA	U		0.191 (L)	
N-MeFOSE	U H		1.91 (L)	
N-EtFOSE	U		1.44 (L)	
HFPO-DA	U		0.727 (L)	
ADONA	U		0.766 (L)	
9CI-PF3ONS	U		0.766 (L)	
11CI-PF3OUDS	U		0.766 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 10 K South Fish #2
Sample Collection:
03-Mar-2020 14:15

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-23
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 06:03:24	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 36
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	34.4	85.9	1:49
13C5-PFPeA		20.0	24.0	120	4:24
13C5-PFHxA		10.0	10.0	100	5:01
13C4-PFHxA		10.0	9.07	90.7	5:28
13C8-PFOA		10.0	8.52	85.2	6:10
13C9-PFNA		5.00	4.33	86.6	7:01
13C6-PFDA		5.00	4.72	94.4	7:32
13C7-PFUuA		5.00	4.54	90.7	7:52
13C2-PFDuA		5.00	4.17	83.4	8:07
13C2-PFTeDA		5.00	3.02	60.5	8:48
13C3-PFBS		10.0	8.12	81.2	4:58
13C3-PFHxA		10.0	8.68	86.8	6:16
13C8-PFOS		10.0	10.2	102	7:38
13C2-4:2 FTS		20.0	25.1	125	4:53
13C2-6:2 FTS		20.0	16.6	83.2	5:53
13C2-8:2 FTS		20.0	20.6	103	7:22
13C8-PFOSA		10.0	12.3	123	8:43
D3-N-MeFOSA		10.0	5.70	57.0	10:09
D5-N-EtFOSA		10.0	6.74	67.4	10:26
D3-MeFOSAA		20.0	23.4	117	7:35
D5-EtFOSAA		20.0	25.9	130	7:43
d7-NMe-FOSE		100	7.37	7.37	10:01
d9-NEt-FOSE		100	83.9	83.9	10:19
13C3-HFPO-DA		40.0	44.9	112	5:09

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-23_Form2_FC0L_206S36_SJ2757462.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 10 K South Fish #3
Sample Collection:
03-Mar-2020 14:20

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-24		
Matrix:	TISSUE	Sample Size:	2.05 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 06:16:29	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 37
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.780 (L)	
PFPeA	U		0.390 (L)	
PFHxA	U		0.195 (L)	
PFHpA	U		0.195 (L)	
PFOA	U		0.195 (L)	
PFNA	U		0.195 (L)	
PFDA	U		0.195 (L)	
PFUnA	U		0.195 (L)	
PFDoA	U		0.195 (L)	
PFTrDA	U		0.195 (L)	
PFTeDA	U		0.195 (L)	
PFBS	U		0.195 (L)	
PFPeS	U		0.195 (L)	
PFHxS	U		0.195 (L)	
PFHpS	U		0.195 (L)	
PFOS	U		0.195 (L)	
PFNS	U		0.195 (L)	
PFDS	U		0.195 (L)	
PFDoS	U H		0.195 (L)	
4:2 FTS	U		0.780 (L)	
6:2 FTS	U		0.702 (L)	
8:2 FTS	U		0.780 (L)	
PFOSA	U		0.195 (L)	
N-MeFOSA	U		0.224 (L)	
N-EtFOSA	U		0.488 (L)	
MeFOSAA	U		0.195 (L)	
EtFOSAA	U		0.195 (L)	
N-MeFOSE	U H		1.95 (L)	
N-EtFOSE	U		1.46 (L)	
HFPO-DA	U		0.741 (L)	
ADONA	U		0.780 (L)	
9CI-PF3ONS	U		0.780 (L)	
11CI-PF3OUDS	U		0.780 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 10 K South Fish #3
Sample Collection:
03-Mar-2020 14:20

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-24
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 06:16:29	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 37
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	35.2	88.1	1:49
13C5-PFPeA		20.0	28.0	140	4:24
13C5-PFHxA		10.0	9.58	95.8	5:01
13C4-PFHxA		10.0	9.08	90.8	5:28
13C8-PFOA		10.0	8.94	89.4	6:10
13C9-PFNA		5.00	4.35	87.0	7:01
13C6-PFDA		5.00	4.82	96.4	7:32
13C7-PFUuA		5.00	4.51	90.1	7:52
13C2-PFDuA		5.00	4.25	85.0	8:07
13C2-PFTeDA		5.00	3.94	78.7	8:48
13C3-PFBS		10.0	6.67	66.7	4:58
13C3-PFHxA		10.0	8.92	89.2	6:16
13C8-PFOS		10.0	10.3	103	7:38
13C2-4:2 FTS		20.0	24.8	124	4:53
13C2-6:2 FTS		20.0	17.1	85.4	5:53
13C2-8:2 FTS		20.0	23.2	116	7:22
13C8-PFOSA		10.0	12.0	120	8:43
D3-N-MeFOSA		10.0	7.66	76.6	10:09
D5-N-EtFOSA		10.0	5.30	53.0	10:26
D3-MeFOSAA		20.0	24.8	124	7:36
D5-EtFOSAA		20.0	26.8	134	7:44
d7-NMe-FOSE		100	7.93	7.93	10:00
d9-NEt-FOSE		100	62.7	62.7	10:19
13C3-HFPO-DA		40.0	52.3	131	5:09

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-24_Form2_FC0L_206S37_SJ2757463.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**

CLIENT SAMPLE NO.
Site 8 Hawaii Kai Fish #1
Sample Collection:
13-Apr-2020 09:00

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-25		
Matrix:	TISSUE	Sample Size:	2.06 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 06:29:27	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 38
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.777 (L)	
PFPeA	U		0.388 (L)	
PFHxA	U		0.194 (L)	
PFHpA	U		0.194 (L)	
PFOA	U		0.194 (L)	
PFNA	U		0.194 (L)	
PFDA	U		0.194 (L)	
PFUnA	U		0.194 (L)	
PFDoA	U		0.194 (L)	
PFTrDA	U		0.194 (L)	
PFTeDA	U		0.194 (L)	
PFBS	U		0.194 (L)	
PFPeS	U		0.194 (L)	
PFHxS	U		0.194 (L)	
PFHpS	U		0.194 (L)	
PFOS	U		0.194 (L)	
PFNS	U		0.194 (L)	
PFDS	U		0.194 (L)	
PFDoS	U H		0.194 (L)	
4:2 FTS	U		0.777 (L)	
6:2 FTS	U		0.699 (L)	
8:2 FTS	U		0.777 (L)	
PFOSA	U		0.194 (L)	
N-MeFOSA	U		0.223 (L)	
N-EtFOSA	U		0.485 (L)	
MeFOSAA	U		0.194 (L)	
EtFOSAA	U		0.194 (L)	
N-MeFOSE	U H		1.94 (L)	
N-EtFOSE	U		1.46 (L)	
HFPO-DA	U		0.738 (L)	
ADONA	U		0.777 (L)	
9CI-PF3ONS	U		0.777 (L)	
11CI-PF3OUDS	U		0.777 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 8 Hawaii Kai Fish #1
Sample Collection:
13-Apr-2020 09:00

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-25
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 06:29:27	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 38
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	36.0	89.9	1:49
13C5-PFPeA		20.0	29.9	149	4:24
13C5-PFHxA		10.0	9.70	97.0	5:00
13C4-PFHxA		10.0	9.67	96.7	5:28
13C8-PFOA		10.0	9.17	91.7	6:10
13C9-PFNA		5.00	4.74	94.7	7:01
13C6-PFDA		5.00	4.82	96.4	7:32
13C7-PFUnA		5.00	4.78	95.6	7:52
13C2-PFDmA		5.00	4.54	90.7	8:07
13C2-PFTeDA		5.00	3.51	70.2	8:48
13C3-PFBS		10.0	7.96	79.6	4:58
13C3-PFHxA		10.0	9.14	91.4	6:16
13C8-PFOS		10.0	9.96	99.6	7:38
13C2-4:2 FTS		20.0	26.2	131	4:53
13C2-6:2 FTS		20.0	17.5	87.4	5:52
13C2-8:2 FTS		20.0	25.0	125	7:22
13C8-PFOSA		10.0	11.7	117	8:43
D3-N-MeFOSA		10.0	7.08	70.8	10:09
D5-N-EtFOSA		10.0	6.06	60.6	10:26
D3-MeFOSAA		20.0	24.5	123	7:35
D5-EtFOSAA		20.0	26.0	130	7:43
d7-NMe-FOSE		100	7.12	7.12	10:00
d9-NEt-FOSE		100	63.1	63.1	10:19
13C3-HFPO-DA		40.0	55.9	140	5:09

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-25_Form2_FC0L_206S38_SJ2757464.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02
**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**
CLIENT SAMPLE NO.
Site 8 Hawaii Kai Fish #2
Sample Collection:
13-Apr-2020 09:00
SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-26		
Matrix:	TISSUE	Sample Size:	2.01 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 06:42:32	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 39
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.796 (L)	
PFPeA	U		0.398 (L)	
PFHxA	U		0.199 (L)	
PFHpA	U		0.199 (L)	
PFOA	U		0.199 (L)	
PFNA	U		0.199 (L)	
PFDA	U		0.199 (L)	
PFUnA	U		0.199 (L)	
PFDoA	U		0.199 (L)	
PFTrDA	U		0.199 (L)	
PFTeDA	U		0.199 (L)	
PFBS	U		0.199 (L)	
PFPeS	U		0.199 (L)	
PFHxS	U		0.199 (L)	
PFHpS	U		0.199 (L)	
PFOS	U		0.199 (L)	
PFNS	U		0.199 (L)	
PFDS	U		0.199 (L)	
PFDoS	U H		0.199 (L)	
4:2 FTS	U		0.796 (L)	
6:2 FTS	U		0.716 (L)	
8:2 FTS	U		0.796 (L)	
PFOSA	U		0.199 (L)	
N-MeFOSA	U		0.229 (L)	
N-EtFOSA	U		0.498 (L)	
MeFOSAA	U		0.199 (L)	
EtFOSAA	U		0.199 (L)	
N-MeFOSE	U H		1.99 (L)	
N-EtFOSE	U		1.49 (L)	
HFPO-DA	U		0.756 (L)	
ADONA	U		0.796 (L)	
9CI-PF3ONS	U		0.796 (L)	
11CI-PF3OUDS	U		0.796 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 8 Hawaii Kai Fish #2
Sample Collection:
13-Apr-2020 09:00

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-26
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 06:42:32	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 39
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	36.3	90.7	1:49
13C5-PFPeA	V	20.0	36.5	182	4:24
13C5-PFHxA		10.0	9.95	99.5	5:01
13C4-PFHxA		10.0	9.60	96.0	5:28
13C8-PFOA		10.0	8.82	88.2	6:10
13C9-PFNA		5.00	4.53	90.5	7:01
13C6-PFDA		5.00	4.70	93.9	7:32
13C7-PFUuA		5.00	4.42	88.5	7:52
13C2-PFDuA		5.00	4.08	81.7	8:07
13C2-PFTeDA		5.00	3.76	75.2	8:48
13C3-PFBS		10.0	7.48	74.8	4:58
13C3-PFHxA		10.0	9.15	91.5	6:16
13C8-PFOS		10.0	10.1	101	7:37
13C2-4:2 FTS		20.0	26.7	133	4:53
13C2-6:2 FTS		20.0	19.1	95.3	5:53
13C2-8:2 FTS		20.0	24.0	120	7:22
13C8-PFOSA		10.0	12.2	122	8:43
D3-N-MeFOSA		10.0	7.24	72.4	10:09
D5-N-EtFOSA		10.0	7.06	70.6	10:26
D3-MeFOSAA		20.0	24.8	124	7:35
D5-EtFOSAA		20.0	26.6	133	7:43
d7-NMe-FOSE		100	7.87	7.87	10:00
d9-NEt-FOSE		100	91.2	91.2	10:19
13C3-HFPO-DA	V	40.0	67.8	170	5:09

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-26_Form2_FC0L_206S39_SJ2757465.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 8 Hawaii Kai Fish #3
Sample Collection:
13-Apr-2020 09:00

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS
Lab Sample I.D.:	L33107-27
Matrix:	TISSUE
Sample Size:	2.05 g (wet)
Sample Receipt Date:	20-May-2020
Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020
Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 06:55:29
Column ID:	C18
Extract Volume (uL):	4000
Sample Data Filename:	FC0L_206 S: 40
Injection Volume (uL):	2
Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A
Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng/g (wet weight basis)

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.780 (L)	
PFPeA	U		0.390 (L)	
PFHxA	U		0.195 (L)	
PFHpA	U		0.195 (L)	
PFOA	U		0.195 (L)	
PFNA	U		0.195 (L)	
PFDA	U		0.195 (L)	
PFUnA	U		0.195 (L)	
PFDoA	U		0.195 (L)	
PFTrDA	U		0.195 (L)	
PFTeDA	U		0.195 (L)	
PFBS	U		0.195 (L)	
PFPeS	U		0.195 (L)	
PFHxS	U		0.195 (L)	
PFHpS	U		0.195 (L)	
PFOS	U		0.195 (L)	
PFNS	U		0.195 (L)	
PFDS	U		0.195 (L)	
PFDoS	U H		0.195 (L)	
4:2 FTS	U		0.780 (L)	
6:2 FTS	U		0.702 (L)	
8:2 FTS	U		0.780 (L)	
PFOSA	U		0.195 (L)	
N-MeFOSA	U		0.224 (L)	
N-EtFOSA	U		0.488 (L)	
MeFOSAA	U		0.195 (L)	
EtFOSAA	U		0.195 (L)	
N-MeFOSE	U H		1.95 (L)	
N-EtFOSE	U		1.46 (L)	
HFPO-DA	U		0.741 (L)	
ADONA	U		0.780 (L)	
9CI-PF3ONS	U		0.780 (L)	
11CI-PF3OUDS	U		0.780 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 8 Hawaii Kai Fish #3
Sample Collection:
13-Apr-2020 09:00

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-27
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 06:55:29	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 40
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	36.1	90.4	1:49
13C5-PFPeA		20.0	28.8	144	4:24
13C5-PFHxA		10.0	10.1	101	5:00
13C4-PFHxA		10.0	9.83	98.3	5:28
13C8-PFOA		10.0	9.50	95.0	6:10
13C9-PFNA		5.00	4.65	93.0	7:01
13C6-PFDA		5.00	5.08	102	7:32
13C7-PFUnA		5.00	4.78	95.5	7:52
13C2-PFDxA		5.00	4.83	96.6	8:07
13C2-PFTeDA		5.00	3.58	71.5	8:48
13C3-PFBS		10.0	7.85	78.5	4:58
13C3-PFHxA		10.0	9.43	94.3	6:16
13C8-PFOS		10.0	10.2	102	7:38
13C2-4:2 FTS		20.0	27.7	138	4:53
13C2-6:2 FTS		20.0	17.7	88.5	5:52
13C2-8:2 FTS		20.0	24.5	122	7:22
13C8-PFOSA		10.0	12.5	125	8:43
D3-N-MeFOSA		10.0	7.58	75.8	10:09
D5-N-EtFOSA		10.0	6.20	62.0	10:26
D3-MeFOSAA		20.0	25.5	127	7:35
D5-EtFOSAA		20.0	29.7	148	7:43
d7-NMe-FOSE		100	7.75	7.75	10:00
d9-NEt-FOSE		100	63.3	63.3	10:19
13C3-HFPO-DA		40.0	54.4	136	5:09

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-27_Form2_FC0L_206S40_SJ2757466.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 12 Marine Corps Far Fish
#1
Sample Collection:
12-Mar-2020 12:50

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Project No.

HDOH-HPU PFAS

Lab Sample I.D.:

L33107-28

Matrix: TISSUE

Sample Size:

2.02 g (wet)

Sample Receipt Date: 20-May-2020

Initial Calibration Date:

18-Mar-2020

Extraction Date: 22-Jun-2020

Instrument ID:

LCMS/MS

Analysis Date: 25-Jun-2020 **Time:** 07:08:34

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC0L_206 S: 41

Injection Volume (uL): 2

Blank Data Filename:

FC0L_206 S: 27

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC0L_206 S: 22

Concentration Units: ng/g (wet weight basis)

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.792 (L)	
PPPeA	U		0.396 (L)	
PFHxA	U		0.198 (L)	
PFHpA	U		0.198 (L)	
PFOA	U		0.198 (L)	
PFNA	U		0.198 (L)	
PFDA	U		0.198 (L)	
PFUnA	U		0.198 (L)	
PFDoA	U		0.198 (L)	
PFTrDA	U		0.198 (L)	
PFTeDA	U		0.198 (L)	
PFBS	U		0.198 (L)	
PPPeS	U		0.198 (L)	
PFHxS	U		0.198 (L)	
PFHpS	U		0.198 (L)	
PFOS	U		0.198 (L)	
PFNS	U		0.198 (L)	
PFDS	U		0.198 (L)	
PFDoS	U H		0.198 (L)	
4:2 FTS	U		0.792 (L)	
6:2 FTS	U		0.713 (L)	
8:2 FTS	U		0.792 (L)	
PFOSA	U		0.198 (L)	
N-MeFOSA	U		0.228 (L)	
N-EtFOSA	U		0.495 (L)	
MeFOSAA	U		0.198 (L)	
EtFOSAA	U		0.198 (L)	
N-MeFOSE	U H		1.98 (L)	
N-EtFOSE	U		1.49 (L)	
HFPO-DA	U		0.752 (L)	
ADONA	U		0.792 (L)	
9CI-PF3ONS	U		0.792 (L)	
11CI-PF3OUdS	U		0.792 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonso _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 12 Marine Corps Far Fish
#1
Sample Collection:
12-Mar-2020 12:50

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 07:08:34	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 41
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	36.1	90.3	1:49
13C5-PFPeA		20.0	26.1	130	4:24
13C5-PFHxA		10.0	10.1	101	5:00
13C4-PFHpA		10.0	9.45	94.5	5:27
13C8-PFOA		10.0	9.05	90.5	6:10
13C9-PFNA		5.00	4.77	95.4	7:01
13C6-PFDA		5.00	5.22	104	7:32
13C7-PFUnA		5.00	4.74	94.7	7:52
13C2-PFDaA		5.00	4.66	93.2	8:07
13C2-PFTeDA		5.00	3.84	76.9	8:48
13C3-PFBS		10.0	8.24	82.4	4:58
13C3-PFHxS		10.0	9.40	94.0	6:16
13C8-PFOS		10.0	10.1	101	7:37
13C2-4:2 FTS		20.0	26.9	134	4:53
13C2-6:2 FTS		20.0	18.2	91.0	5:52
13C2-8:2 FTS		20.0	23.5	118	7:22
13C8-PFOSA		10.0	11.8	118	8:43
D3-N-MeFOSA		10.0	6.86	68.6	10:09
D5-N-EtFOSA		10.0	7.36	73.6	10:26
D3-MeFOSAA		20.0	21.7	109	7:35
D5-EtFOSAA		20.0	24.8	124	7:44
d7-NMe-FOSE		100	7.55	7.55	10:01
d9-NEt-FOSE		100	80.5	80.5	10:19
13C3-HFPO-DA		40.0	48.7	122	5:09

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-28_Form2_FC0L_206S41_SJ2757467.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.

Lab Blank
Sample Collection:
N/A

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Project No.

N/A

Lab Sample I.D.:

WG72537-101

Matrix: TISSUE

Sample Size:

2.00 g

Sample Receipt Date: N/A

Initial Calibration Date:

18-Mar-2020

Extraction Date: 22-Jun-2020

Instrument ID:

LCMS/MS

Analysis Date: 25-Jun-2020 **Time:** 04:06:18

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC0L_206 S: 27

Injection Volume (uL): 2

Blank Data Filename:

FC0L_206 S: 27

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC0L_206 S: 22

Concentration Units: ng/g

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.800 (L)	
PFPeA	U		0.400 (L)	
PFHxA	U		0.200 (L)	
PFHpA	U		0.200 (L)	
PFOA	U		0.200 (L)	
PFNA		0.434	0.200 (L)	
PFDA	U		0.200 (L)	
PFUnA	J	0.341	0.200 (L)	7:52
PFDoA	U		0.200 (L)	
PFTrDA	U		0.200 (L)	
PFTeDA	U		0.200 (L)	
PFBS	U		0.200 (L)	
PFPeS	U		0.200 (L)	
PFHxS	U		0.200 (L)	
PFHpS	U		0.200 (L)	
PFOS	U		0.200 (L)	
PFNS	U		0.200 (L)	
PFDS	U		0.200 (L)	
PFDoS	U H		0.200 (L)	
4:2 FTS	U		0.800 (L)	
6:2 FTS	U		0.720 (L)	
8:2 FTS	U		0.800 (L)	
PFOSA	U		0.200 (L)	
N-MeFOSA	U		0.230 (L)	
N-EtFOSA	U		0.500 (L)	
MeFOSAA	U		0.200 (L)	
EtFOSAA	U		0.200 (L)	
N-MeFOSE	U H		2.00 (L)	
N-EtFOSE	U		1.50 (L)	
HFPO-DA	U		0.760 (L)	
ADONA	U		0.800 (L)	
9CI-PF3ONS	U		0.800 (L)	
11CI-PF3OUdS	U		0.800 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; J = concentration less than limit of quantification; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonso _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Lab Blank
Sample Collection:
N/A

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	N/A
Sample Receipt Date:	N/A	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 04:06:18	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 27
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	37.9	94.7	1:49
13C5-PFPeA		20.0	21.9	110	4:24
13C5-PFHxA		10.0	10.2	102	5:00
13C4-PFHxA		10.0	9.80	98.0	5:28
13C8-PFOA		10.0	10.1	101	6:10
13C9-PFNA		5.00	4.79	95.7	7:01
13C6-PFDA		5.00	5.59	112	7:32
13C7-PFUuA		5.00	5.96	119	7:52
13C2-PFDuA		5.00	5.64	113	8:07
13C2-PFTeDA		5.00	4.83	96.5	8:49
13C3-PFBS		10.0	9.79	97.9	4:58
13C3-PFHxA		10.0	9.77	97.7	6:16
13C8-PFOS		10.0	10.5	105	7:37
13C2-4:2 FTS		20.0	27.5	137	4:53
13C2-6:2 FTS		20.0	19.3	96.4	5:52
13C2-8:2 FTS		20.0	23.6	118	7:22
13C8-PFOSA		10.0	13.0	130	8:44
D3-N-MeFOSA		10.0	7.65	76.5	10:09
D5-N-EtFOSA		10.0	7.34	73.4	10:27
D3-MeFOSAA		20.0	27.2	136	7:35
D5-EtFOSAA		20.0	35.4	177	7:44
d7-NMe-FOSE		100	8.64	8.64	10:01
d9-NEt-FOSE		100	67.9	67.9	10:19
13C3-HFPO-DA		40.0	40.2	101	5:09

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_WG72537-101_Form2_FC0L_206S27_SJ2757452.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 8A

PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4066	Lab Sample I.D.:	WG72537-102
Matrix:	TISSUE	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 03:40:16	Column ID:	C18
Extract Volume (uL):	4000	OPR Data Filename:	FC0L_206 S: 25
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

COMPOUND	LAB FLAG ¹	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
PFBA		40.0	38.0	95.1	1:50
PFPeA		20.0	18.7	93.5	4:24
PFHxA		10.0	9.22	92.2	5:01
PFHpA		10.0	9.32	93.2	5:28
PFOA		10.0	8.82	88.2	
PFNA		10.0	9.47	94.7	
PFDA		10.0	8.74	87.4	7:32
PFUnA		10.0	9.35	93.5	7:52
PFDoA		10.0	9.58	95.8	8:07
PFTrDA		10.0	8.94	89.4	8:25
PFTeDA		10.0	9.77	97.7	8:48
PFBS		10.0	9.25	92.5	4:58
PFPeS		10.0	9.68	96.8	5:29
PFHxS		10.0	9.10	91.0	
PFHpS		10.0	8.72	87.2	7:08
PFOS		10.0	8.77	87.7	
PFNS		10.0	7.92	79.2	7:57
PFDS		10.0	8.44	84.4	8:13
PFDoS	H	10.0	8.77	87.7	8:58
4:2 FTS		40.0	39.7	99.1	4:53
6:2 FTS		36.1	36.6	102	5:53
8:2 FTS		40.0	37.9	94.7	7:22
PFOSA		10.0	9.53	95.3	
N-MeFOSA		11.5	13.4	116	
N-EtFOSA		25.0	21.3	85.4	
MeFOSAA		10.0	9.12	91.2	
EtFOSAA		10.0	9.36	93.6	
N-MeFOSE	H	100	92.2	92.2	
N-EtFOSE	N	75.0	49.4	65.8	
HFPO-DA		38.0	36.4	95.9	5:09
ADONA		40.0	41.7	104	5:40
9CI-PF3ONS		40.0	41.7	104	7:51
11CI-PF3OUdS		40.0	40.4	101	8:26

(1) Where applicable, custom lab flags have been used on this report; N = authentic recovery in the OPR is not within method/contract control limits; H = concentration is estimated.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

SGS AXYS METHOD MLA-110 Rev 02

Form 8B

PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4066	Lab Sample I.D.:	WG72537-102
Matrix:	TISSUE	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 03:40:16	Column ID:	C18
Extract Volume (uL):	4000	OPR Data Filename:	FC0L_206 S: 25
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 27
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 22

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
13C4-PFBA		40.0	36.8	91.9	1:50
13C5-PFPeA		20.0	21.6	108	4:24
13C5-PFHxA		10.0	10.1	101	5:00
13C4-PFHpA		10.0	9.48	94.8	5:28
13C8-PFOA		10.0	9.58	95.8	6:10
13C9-PFNA		5.00	4.61	92.3	7:01
13C6-PFDA		5.00	4.77	95.4	7:32
13C7-PFUnA		5.00	4.73	94.6	7:52
13C2-PFDmA		5.00	4.93	98.6	8:07
13C2-PFTeDA		5.00	4.09	81.9	8:48
13C3-PFBs		10.0	9.66	96.6	4:58
13C3-PFHxS		10.0	9.54	95.4	6:16
13C8-PFOS		10.0	10.4	104	7:37
13C2-4:2 FTS		20.0	34.9	174	4:53
13C2-6:2 FTS		20.0	21.6	108	5:52
13C2-8:2 FTS		20.0	34.3	172	7:22
13C8-PFOSA		10.0	10.5	105	8:45
D3-N-MeFOSA		10.0	1.19	11.9	10:09
D5-N-EtFOSA		10.0	5.49	54.9	10:26
D3-MeFOSAA		20.0	33.1	165	7:35
D5-EtFOSAA		20.0	41.4	207	7:43
d7-NMe-FOSE		100	8.25	8.25	10:00
d9-NEt-FOSE		100	29.1	29.1	10:19
13C3-HFPO-DA		40.0	38.2	95.6	5:09

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

For Axys Internal Use Only [XSL Template: FC-Form8B.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_WG72537-102_Form8B_SJ2757449.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02**Form 8G****CERTIFIED REFERENCE MATERIAL (CRM) REPORT FOR NIST SRM 1947****SGS AXYS ANALYTICAL SERVICES**

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4066	Lab Sample I.D.:	WG72537-103
Matrix:	TISSUE	Sample Size:	2.06 g (wet)
Extraction Date:	22-Jun-2020	Initial Calibration Date:	18-Mar-2020
Analysis Date:	25-Jun-2020 Time: 07:34:36	Instrument ID:	LCMS/MS
Extract Volume (uL):	4000	GC Column ID:	C18
Injection Volume (uL):	2	Sample Data Filename:	FC0L_206 S: 43
Dilution Factor:	N/A	Blank Data Filename:	FC0L_206 S: 27
Concentration Units:	ng/g (wet weight basis)	Cal. Ver. Data Filename:	FC0L_206 S: 22

COMPOUND	CAS. NO.	LAB FLAG¹	DETERMINED	CERTIFIED / REFERENCE
PFOS	45298-90-6		5.68	5.9 +/- 0.39

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

For Axys Internal Use Only [XSL Template: Pest8G.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8; Report Filename: _FC_LC_PFAS_WG72537-103_Form8G_SJ2757469.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 8H

CERTIFIED REFERENCE MATERIAL (CRM) REPORT FOR NIST SRM 1947

SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4066	Lab Sample I.D.:	WG72537-103
Matrix:	TISSUE	Sample Size:	2.06 g (wet)
Extraction Date:	22-Jun-2020	Initial Calibration Date:	18-Mar-2020
Analysis Date:	25-Jun-2020 Time: 07:34:36	Instrument ID:	LCMS/MS
Extract Volume (uL):	4000	GC Column ID:	C18
Injection Volume (uL):	2	Sample Data Filename:	FC0L_206 S: 43
Dilution Factor:	N/A	Blank Data Filename:	FC0L_206 S: 27
Concentration Units:	ng absolute	Cal. Ver. Data Filename:	FC0L_206 S: 22

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	ION ABUND. RATIO	RRT
13C4-PFBA		40.0	34.4	86.0		
13C5-PFPeA		20.0	20.2	101		
13C5-PFhxA		10.0	9.34	93.4		
13C4-PFhpA		10.0	8.63	86.3		
13C8-PFOA		10.0	8.69	86.9		
13C9-PFNA		5.00	4.10	82.0		
13C6-PFDA		5.00	4.82	96.3		
13C7-PFunA		5.00	4.33	86.6		
13C2-PFDaA		5.00	3.03	60.6		
13C2-PFTeDA	V	5.00	0.781	15.6		
13C3-PFBs		10.0	8.95	89.5		
13C3-PFhxs		10.0	8.97	89.7		
13C8-PFOS		10.0	9.71	97.1		
13C2-4:2 FTS		20.0	31.4	157		
13C2-6:2 FTS		20.0	28.5	143		
13C2-8:2 FTS		20.0	37.9	189		
13C8-PFOSA		10.0	11.0	110		
D3-N-MeFOSA		10.0	4.27	42.7		
D5-N-EtFOSA		10.0	4.97	49.7		
D3-MeFOSAA		20.0	32.2	161		
D5-EtFOSAA		20.0	32.3	162		
d7-NMe-FOSE		100	36.4	36.4		
d9-NEt-FOSE		100	58.2	58.2		
13C3-HFPO-DA		40.0	32.8	82.0		

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.
 (2) R% = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

For Axys Internal Use Only [XSL Template: Pest8H.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
 Report Filename: _FC_LC_PFAS_WG72537-103_Form8H_SJ2757469.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 3A
LC MS/MS INITIAL CALIBRATION PERCENT RECOVERIES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC0L_082 S: 10

CS2 Data Filename: FC0L_082 S: 11

CS3 Data Filename: FC0L_082 S: 12

CS4 Data Filename: FC0L_082 S: 13

CS5 Data Filename: FC0L_082 S: 14

CS6 Data Filename: FC0L_082 S: 15

CS7 Data Filename: FC0L_082 S: 16

CS8 Data Filename: N/A

COMPOUND	LAB FLAG ¹	PERCENT RECOVERY (%)								
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
PFBA		105	104	101	99.8	94.2	96.1	100		
PFPeA		102	105	100	101	94.3	97.4	100		
PFHxA		112	108	101	98.0	88.5	94.8	97.3		
PFHpA		115	110	97.6	92.5	92.6	96.9	95.4		
PFOA		118	111	103	91.3	86.1	95.5	94.8		
PFNA		105	98.7	97.9	105	90.6	98.1	105		
PFDA		103	112	99.4	96.1	93.4	91.8	104		
PFUnA		99.9	99.9	102	103	96.3	102	97.3		
PFDoA		100	97.1	88.5	125	102	104	83.9		
PFTrDA		94.2	106	103	114	95.7	87.5			
PFTeDA		119	111	106	105	95.9	87.9	74.8		
PFBS		102	108	101	103	94.0	93.8	98.1		
PFPeS		102	106	101	105	97.1	97.7	90.3		
PFHxS		101	103	101	97.2	91.2	97.3	109		
PFHpS		100	114	101	99.9	90.6	95.7	98.7		
PFOS		119	115	91.5	93.3	89.6	91.4	101		
PFNS		114	129	76.4	83.2	81.8	107	108		
PFDS		112	118	93.5	94.2	91.1	90.4	101		
PFDoS		99.1	117	97.2	99.1	91.9	93.7	102		
4:2 FTS		114	101	102	111	99.9	95.9	76.0		
6:2 FTS		110	117	98.7	100	91.5	82.6			
8:2 FTS		94.7	117	102	100	100	85.4			
PFOSA		109	103	96.9	98.6	94.3	96.3	102		
N-MeFOSA		92.0	116	108	109	98.9	96.2	80.2		
N-EtFOSA		96.6	112	99.7	97.5	95.4	97.1	102		
MeFOSAA		98.3	104	97.0	110	97.2	102	91.0		
EtFOSAA		121	80.0	110	102	93.5	91.3	102		
N-MeFOSE		107	106	103	101	94.2	95.5	93.8		
N-EtFOSE		101	105	107	102	95.3	96.9	93.0		
HFPO-DA		104	104	105	106	99.2	95.5	86.5		
ADONA		104	98.2	99.7	102	99.3	95.9	101		
9CI-PF3ONS		105	111	104	107	97.3	90.9	84.9		
11CI-PF3OUdS		106	109	101	98.1	94.7	94.3	96.9		

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

For Axys Internal Use Only [XSL Template: FC-Form3A.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
Report Filename: PFOA_FC_LC_18-Mar-2020_FC0L__Form3A_GS88019.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 3B
LC MS/MS INITIAL CALIBRATION PERCENT RECOVERIES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename:	N/A
CS1 Data Filename:	FC0L_082 S: 10
CS2 Data Filename:	FC0L_082 S: 11
CS3 Data Filename:	FC0L_082 S: 12
CS4 Data Filename:	FC0L_082 S: 13
CS5 Data Filename:	FC0L_082 S: 14
CS6 Data Filename:	FC0L_082 S: 15
CS7 Data Filename:	FC0L_082 S: 16
CS8 Data Filename:	N/A

LABELED COMPOUND	LAB FLAG ¹	PERCENT RECOVERIES (%)							
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7
13C4-PFBA		99.0	102	99.9	99.7	100	99.5	99.1	
13C5-PFPeA		108	106	104	105	103	94.5	79.2	
13C5-PFHxA		102	103	99.3	101	102	99.2	94.1	
13C4-PFHxA		95.2	106	105	106	106	94.9	86.8	
13C8-PFOA		97.0	101	103	101	106	95.5	95.7	
13C9-PFNA		97.7	105	104	99.3	97.3	102	95.1	
13C6-PFDA		114	108	82.8	113	106	98.3	77.0	
13C7-PFUuA		114	118	103	103	93.3	67.7		
13C2-PFDooA		111	111	96.0	85.8	98.6	94.8	103	
13C2-PFTeDA		97.0	102	95.6	94.2	94.1	99.3	118	
13C3-PFBS		97.7	112	105	102	101	99.2	82.6	
13C3-PFHxS		101	104	102	99.9	101	101	91.4	
13C8-PFOS		99.7	88.7	104	104	100	105	98.6	
13C2-4:2 FTS		105	116	109	96.6	73.2			
13C2-6:2 FTS		105	116	115	106	88.3	70.0		
13C2-8:2 FTS		111	116	116	114	85.5	71.7	85.6	
13C8-PFOSA		92.4	95.4	90.5	92.6	90.8	104	134	
D3-N-MeFOSA		97.8	101	88.3	95.5	100	118		
D5-N-EtFOSA		97.3	96.0	91.1	95.6	90.7	107	122	
D3-MeFOSAA		96.2	92.6	97.5	93.6	95.9	103	121	
D5-EtFOSAA		97.5	100	93.2	97.7	96.2	109	106	
d7-NMe-FOSE		95.8	95.8	89.7	96.2	95.8	107	120	
d9-NEt-FOSE		95.6	98.2	88.6	95.4	93.9	105	124	
13C3-HFPO-DA		109	110	110	107	101	90.0	72.7	

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

SGS AXYS METHOD MLA-110 Rev 02

Form 3C
LC MS/MS INITIAL CALIBRATION RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A
CS1 Data Filename: FC0L_082 S: 10

CS2 Data Filename: FC0L_082 S: 11

CS3 Data Filename: FC0L_082 S: 12

CS4 Data Filename: FC0L_082 S: 13

CS5 Data Filename: FC0L_082 S: 14

CS6 Data Filename: FC0L_082 S: 15

CS7 Data Filename: FC0L_082 S: 16

CS8 Data Filename: N/A

COMPOUND	LAB FLAG ¹	RETENTION TIMES								MEAN RT
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	
PFBA		1:58	1:58	1:58	1:58	1:58	1:58	1:58	1:58	1:58
PFPeA		4:19	4:19	4:19	4:19	4:19	4:19	4:19	4:19	4:19
PFHxA		4:54	4:54	4:53	4:53	4:54	4:54	4:54	4:54	4:54
PFHpA		5:23	5:23	5:23	5:23	5:23	5:23	5:23	5:24	5:23
PFOA		6:11	6:11	6:11	6:11	6:11	6:11	6:11	6:11	6:11
PFNA		7:02	7:03	7:02	7:03	7:02	7:02	7:02	7:02	7:02
PFDA		7:34	7:34	7:33	7:34	7:33	7:34	7:33	7:34	7:34
PFUnA		7:54	7:54	7:53	7:54	7:54	7:54	7:54	7:54	7:54
PFDoA		8:10	8:10	8:10	8:10	8:10	8:10	8:10	8:10	8:10
PFTrDA		8:30	8:30	8:29	8:29	8:30	8:30	8:30	8:30	8:30
PFTeDA		8:55	8:55	8:55	8:55	8:55	8:55	8:55	8:55	8:55
PFBS		4:51	4:51	4:51	4:51	4:51	4:51	4:51	4:51	4:51
PFPeS		5:25	5:26	5:25	5:25	5:25	5:25	5:26	5:26	5:25
PFHxS		6:17	6:17	6:17	6:17	6:17	6:17	6:17	6:17	6:17
PFHpS		7:09	7:09	7:09	7:09	7:09	7:09	7:09	7:09	7:09
PFOS		7:40	7:40	7:39	7:40	7:39	7:40	7:39	7:40	7:40
PFNS		7:59	7:59	7:59	7:59	7:59	7:59	7:59	7:59	7:59
PFDS		8:16	8:16	8:16	8:16	8:16	8:16	8:16	8:16	8:16
PFDoS		9:06	9:06	9:06	9:06	9:06	9:06	9:06	9:06	9:06
4:2 FTS		4:46	4:46	4:46	4:46	4:46	4:46	4:46	4:46	4:46
6:2 FTS		5:51	5:51	5:51	5:51	5:51	5:51	5:51	5:51	5:51
8:2 FTS		7:24	7:23	7:23	7:23	7:23	7:23	7:23	7:23	7:23
PFOSA		8:45	8:45	8:45	8:45	8:45	8:45	8:45	8:45	8:45
N-MeFOSA		10:12	10:12	10:12	10:12	10:12	10:12	10:12	10:12	10:12
N-EtFOSA		10:30	10:30	10:31	10:30	10:30	10:30	10:30	10:30	10:30
MeFOSAA		7:37	7:37	7:37	7:37	7:37	7:37	7:37	7:37	7:37
EtFOSAA		7:46	7:46	7:45	7:46	7:45	7:46	7:45	7:46	7:46
N-MeFOSE		10:04	10:03	10:04	10:04	10:04	10:04	10:04	10:04	10:04
N-EtFOSE		10:23	10:23	10:23	10:23	10:23	10:23	10:23	10:23	10:23
HFPO-DA		5:03	5:03	5:03	5:03	5:03	5:03	5:03	5:03	5:03
ADONA		5:38	5:38	5:38	5:38	5:38	5:38	5:38	5:38	5:38
9CI-PF3ONS		7:54	7:54	7:53	7:53	7:53	7:54	7:53	7:53	7:53
11CI-PF3OUdS		8:31	8:31	8:31	8:31	8:31	8:31	8:31	8:31	8:31

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

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Report Filename: PFOA_FC_LC_18-Mar-2020_FC0L_Form3C_GS88019.html; Workgroup: WG72537; Design ID: 3990]



SGS AXYS METHOD MLA-110 Rev 02

Form 3D
LC MS/MS INITIAL CALIBRATION RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC0L_082 S: 10

CS2 Data Filename: FC0L_082 S: 11

CS3 Data Filename: FC0L_082 S: 12

CS4 Data Filename: FC0L_082 S: 13

CS5 Data Filename: FC0L_082 S: 14

CS6 Data Filename: FC0L_082 S: 15

CS7 Data Filename: FC0L_082 S: 16

CS8 Data Filename: N/A

LAB FLAG ¹	RETENTION TIMES								MEAN RT
	CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
LABELED COMPOUND									
13C4-PFBA	1:57	1:57	1:57	1:57	1:57	1:57	1:57	1:57	1:57
13C5-PFPeA	4:18	4:19	4:18	4:18	4:19	4:19	4:19	4:19	4:19
13C5-PFHxA	4:53	4:53	4:53	4:53	4:53	4:54	4:54	4:53	4:53
13C4-PFHpA	5:23	5:23	5:23	5:23	5:23	5:23	5:23	5:23	5:23
13C8-PFOA	6:11	6:11	6:11	6:11	6:11	6:11	6:11	6:11	6:11
13C9-PFNA	7:02	7:02	7:02	7:02	7:02	7:02	7:02	7:02	7:02
13C6-PFDA	7:34	7:34	7:33	7:34	7:33	7:33	7:33	7:33	7:33
13C7-PFUnA	7:54	7:54	7:53	7:54	7:53	7:54	7:54	7:54	7:54
13C2-PFDaA	8:10	8:10	8:10	8:10	8:10	8:10	8:10	8:10	8:10
13C2-PFTeDA	8:55	8:55	8:55	8:55	8:55	8:55	8:55	8:55	8:55
13C3-PFBS	4:51	4:51	4:51	4:51	4:51	4:51	4:51	4:51	4:51
13C3-PFHxS	6:17	6:17	6:17	6:17	6:17	6:17	6:17	6:17	6:17
13C8-PFOS	7:40	7:40	7:39	7:40	7:39	7:40	7:39	7:40	7:40
13C2-4:2 FTS	4:46	4:46	4:46	4:46	4:46	4:46			4:46
13C2-6:2 FTS	5:51	5:51	5:51	5:51	5:51	5:51			5:51
13C2-8:2 FTS	7:23	7:24	7:23	7:23	7:23	7:23			7:23
13C8-PFOSA	8:45	8:45	8:45	8:45	8:45	8:45			8:45
D3-N-MeFOSA	10:11	10:11	10:12	10:11	10:12	10:11			10:11
D5-N-EtFOSA	10:30	10:30	10:30	10:30	10:30	10:30			10:30
D3-MeFOSAA	7:37	7:37	7:37	7:37	7:37	7:37			7:37
D5-EtFOSAA	7:45	7:45	7:45	7:45	7:45	7:45			7:45
d7-NMe-FOSE	10:03	10:02	10:03	10:03	10:03	10:03			10:03
d9-NEt-FOSE	10:22	10:22	10:22	10:22	10:22	10:22			10:22
13C3-HFPO-DA	5:03	5:03	5:03	5:03	5:03	5:03			5:03

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

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Report Filename: PFOA_FC_LC_18-Mar-2020_FC0L__Form3D_GS88019.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 4A
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date:	18-Mar-2020	VER Data Filename:	FC0L_206 S: 22
Instrument ID:	LCMS/MS	Analysis Date:	25-Jun-2020
LC Column ID:	C18	Analysis Time:	03:01:09

COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
PFBA		1:53	40.0	38.8	97.1
PFPeA		4:25	20.0	19.1	95.3
PFHxA		5:01	10.0	9.54	95.4
PFHpA		5:28	10.0	9.19	91.9
PFOA		6:11	10.0	9.09	90.9
PFNA		7:02	10.0	9.74	97.4
PFDA		7:33	10.0	9.98	99.8
PFUnA		7:52	10.0	9.68	96.8
PFDoA		8:07	10.0	9.34	93.4
PFTrDA		8:26	10.0	9.41	94.1
PFTeDA		8:50	10.0	10.1	101
PFBS		4:58	10.0	9.50	95.0
PFPeS		5:29	10.0	10.2	102
PFHxS		6:17	10.0	9.00	90.0
PFHpS		7:08	10.0	9.23	92.3
PFOS		7:38	10.0	8.57	85.7
PFNS		7:57	10.0	10.5	105
PFDS		8:13	10.0	9.43	94.3
PFDoS		9:00	10.0	9.23	92.3
4:2 FTS		4:53	40.0	39.1	97.9
6:2 FTS		5:53	36.0	36.0	100
8:2 FTS		7:22	40.0	38.0	95.0
PFOSA		8:43	10.0	9.51	95.1
N-MeFOSA		10:09	11.5	12.1	105
N-EtFOSA		10:27	25.0	23.1	92.2
MeFOSAA		7:36	10.0	9.98	99.8
EtFOSAA		7:44	10.0	10.0	100
N-MeFOSE		10:02	100	98.3	98.3
N-EtFOSE		10:20	75.0	75.4	101
HFPO-DA		5:09	40.0	38.8	97.0
ADONA		5:41	40.0	41.3	103
9CI-PF3ONS		7:52	40.0	42.7	107
11CI-PF3OUdS		8:27	40.0	41.3	103

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form4A.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
 Report Filename: PFOA_FC_LC_FC0L_206S22__Form4A_SJ2757446.html; Workgroup: WG72537; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 4B
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date:	18-Mar-2020	VER Data Filename:	FC0L_206 S: 22
Instrument ID:	LCMS/MS	Analysis Date:	25-Jun-2020
LC Column ID:	C18	Analysis Time:	03:01:09

LABELED COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
13C4-PFBA		1:53	40.0	38.9	97.3
13C5-PFPeA		4:25	20.0	21.3	106
13C5-PFHxA		5:01	10.0	9.99	99.9
13C4-PFHpA		5:28	10.0	10.2	102
13C8-PFOA		6:11	10.0	9.82	98.2
13C9-PFNA		7:02	5.00	5.10	102
13C6-PFDA		7:33	5.00	4.96	99.2
13C7-PFUnA		7:52	5.00	4.96	99.2
13C2-PFDmA		8:07	5.00	5.29	106
13C2-PFTeDA		8:49	5.00	4.30	86.0
13C3-PFBS		4:58	9.18	9.62	105
13C3-PFHxS		6:17	10.0	9.94	99.4
13C8-PFOS		7:38	10.0	10.3	103
13C2-4:2 FTS		4:53	20.0	18.7	93.4
13C2-6:2 FTS		5:53	20.0	19.7	98.7
13C2-8:2 FTS		7:22	20.0	21.9	110
13C8-PFOSA		8:43	10.0	9.49	94.9
D3-N-MeFOSA		10:09	10.0	10.1	101
D5-N-EtFOSA		10:26	10.0	9.99	99.9
D3-MeFOSAA		7:36	20.0	20.1	100
D5-EtFOSAA		7:44	20.0	19.3	96.5
d7-NMe-FOSE		10:01	100	99.1	99.1
d9-NEt-FOSE		10:19	100	95.7	95.7
13C3-HFPO-DA		5:09	40.0	37.3	93.4

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form4B.xsl; Created: 21-Jul-2020 14:00:24; Application: XMLTransformer-1.18.8;
 Report Filename: PFOA_FC_LC_FC0L_206S22__Form4B_SJ2757446.html; Workgroup: WG72537; Design ID: 3990]

Accreditation Scope
SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 50

Accreditation Scope
SGS AXYS Analytical Services Ltd.
file ref: ACC-101 Rev. 50

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum								Solids				
				CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE
Endrin aldehyde	EPA 608	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8081	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8081	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Endrin ketone	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8081	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8081	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8081	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
GammahCH (Undane)	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Heptachlor	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Tissue
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Hexachlorobenzene	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Urine
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Methoxychlor	EPA 608	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Water	
	EPA 8081	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Minex	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Water, Non-Potable	
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Oxydorane	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	AFF
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Tropane	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
trans-Chlorodane (gamma-Chlorodane)	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Page 3 of 34
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
trans-Nonachlor	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Page 48 of 79
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AX													

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Serum	Solids	Tissue	Urine	Water	Water, Non-Potable	AFFF
	1,2,6-Trimethylbenzene	SGS AXYS MLA-021	MLA-021	Y							
	1,4,6,7-Tetramethylbenzene	SGS AXYS MLA-021	MLA-021	Y							
	1,7-Dimethylfluorene	SGS AXYS MLA-021	MLA-021	Y							
	1,7-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021	Y							
	1,8-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021	Y							
	1-Methyltropyne	SGS AXYS MLA-021	MLA-021	Y							
	1-Helvynaphthalene	SGS AXYS MLA-021	MLA-021	Y							
	1-Methylphenanthrene	SGS AXYS MLA-021	MLA-021	Y							
	2,3,5-Trimethylphenanthrene	SGS AXYS MLA-021	MLA-021	Y							
	2,3,6-Trimethylphenanthrene	SGS AXYS MLA-021	MLA-021	Y							
	2,4-Dimethylbenzocycloheptene	SGS AXYS MLA-021	MLA-021	Y							
	2,6-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021	Y							
	2,6-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021	Y							
	2-Methylanthracene	SGS AXYS MLA-021	MLA-021	Y							
	2-Methylbenzothiophene	SGS AXYS MLA-021	MLA-021	Y							
	2-Methylfluorene	EPA 8270	MLA-021	Y							
	2-Methylnaphthalene	SGS AXYS MLA-021	MLA-021	Y							
	2,6-Dimethylnaphthalene	SGS AXYS MLA-021	MLA-021	Y							
	3,6-Dimethylnaphthalene	SGS AXYS MLA-021	MLA-021	Y							
	3,6-Dimethylbenzothiophene	SGS AXYS MLA-021	MLA-021	Y							
	3-Methylfloranthene	SGS AXYS MLA-021	MLA-021	Y							
	3-Methylnaphthalene	SGS AXYS MLA-021	MLA-021	Y							
	5,9-Dimethylxylene	SGS AXYS MLA-021	MLA-021	Y							
	5,6-Dimethylxylanes	SGS AXYS MLA-021	MLA-021	Y							
	7,7-Methylbicyclo[4.1.0]hept-5-ene	SGS AXYS MLA-021	MLA-021	Y							
	9,9-Methylbiphenyls	SGS AXYS MLA-021	MLA-021	Y							
	Acenaphthene	EPA 1625	MLA-021	Y							
	Anthracene	EPA 8270	MLA-021	Y							
	Acenaphthylene	EPA 1625	MLA-021	Y							
	Benz[a]anthracene	EPA 8270	MLA-021	Y							
	Benz[a]pyrene	EPA 1625	MLA-021	Y							
	Benzog[hi]perylene	EPA 8270	MLA-021	Y							
	Benzog[b]fluoranthene	EPA 8270	MLA-021	Y							
	Benzofluoranthenes	EPA 1625	MLA-021	Y							
	Benzofluoranthene	EPA 8270	MLA-021	Y							
	Benzog[hi]perylene	EPA 1625	MLA-021	Y							
	Biphenyl	EPA 8270	MLA-021	Y							
	C1-Aceanaphthalenes	EPA 8270	MLA-021	Y							
	C1-Benzo(a)anthracenes/phenanthrenes	EPA 8270	MLA-021	Y							
	C1-Biphenyls	EPA 8270	MLA-021	Y							
	C1-Dibenzofuran/Phenanthrene	EPA 8270	MLA-021	Y							
	C1-Fluoranthenes/Pyrenes	EPA 8270	MLA-021	Y							
	C1-Fluorenes	EPA 8270	MLA-021	Y							
	C1-Naphthalenes	EPA 8270	MLA-021	Y							

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum		Solids
				CALA	Alaska DEC ANAB DoD ** ANAB ISO 17025	
C1-Pheanthrenes/Antrazenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Benz(a)anthracenes/Cintronenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Benzo(a)anthracenes/Benzopyrenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Biphenyl		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Dibenzanthracene		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Dibenzanthracenes/Pyrenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Fluoranthrenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Naphthalenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Pheanthrenes/Antrazenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C3-Benz(a)anthracenes/Cintronenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C3-Dibenzanthracene		SGS AXYS MLA-021	MLA-021	Y	Y	
C3-Fluoranthrenes/Pyrenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C3-Hydroxytes		SGS AXYS MLA-021	MLA-021	Y	Y	
C3-Naphthalenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C3-Pheanthrenes/Antrazenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C4-Benz(a)anthracenes/Cintronenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C4-Dibenzanthracene		SGS AXYS MLA-021	MLA-021	Y	Y	
C4-Fluoranthrenes/Pyrenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C4-Naphthalenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C4-Pheanthrenes/Antrazenes		SGS AXYS MLA-021	MLA-021	Y	Y	
Chrysene		EPA 1625	MLA-021	Y	Y	
Dibenz(a)anthracene		SGS AXYS MLA-021	MLA-021	Y	Y	
Fluorene		EPA 1625	MLA-021	Y	Y	
Dibenzothiophene		SGS AXYS MLA-021	MLA-021	Y	Y	
Fluoranthene		SGS AXYS MLA-021	MLA-021	Y	Y	
Indeno[1,2,3-cd]pyrene		EPA 1625	MLA-021	Y	Y	
Naphthalene		EPA 1625	MLA-021	Y	Y	
Pyrene		EPA 1625	MLA-021	Y	Y	
Perylene		SGS AXYS MLA-021	MLA-021	Y	Y	
Phenanthrene		SGS AXYS MLA-021	MLA-021	Y	Y	
Retene		SGS AXYS MLA-021	MLA-021	Y	Y	
BDE-10,2,6-dibromodiphenylether		EPA 1614	MLA-033	Y	Y	
BDE-10,2,2,4,4'-pentabromodiphenylether		SGS AXYS MLA-033	MLA-033	Y	Y	
BDE-10,2,2,4,4'-pentabromodiphenylether		EPA 1614	MLA-033	Y	Y	
BDE-10,2,3,3',4,4'-hexabromodiphenylether		SGS AXYS MLA-033	MLA-033	Y	Y	
BDE-11,3,3'-dibromodiphenylether		EPA 1614	MLA-033	Y	Y	
BDE-12,3,4-dibromodiphenylether		SGS AXYS MLA-033	MLA-033	Y	Y	
BDE-12,3,3,4,4'-pentabromodiphenylether		EPA 1614	MLA-033	Y	Y	
BDE-12,3,3,4,4'-pentabromodiphenylether		SGS AXYS MLA-033	MLA-033	Y	Y	
BDE-13,3,4-dibromodiphenylether		EPA 1614	MLA-033	Y	Y	
BDE-13,3,4-dibromodiphenylether		SGS AXYS MLA-033	MLA-033	Y	Y	

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum								Solids			
				CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS
PCB 23/34	PCB 23,6-Trichlorobiphenyl	EPA 8270	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 24/27	PCB 24,2,3,6-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 25/28	PCB 25,2,3,4-Trichlorobiphenyl	EPA 8270	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 26/28	PCB 26,2,3,5-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 27/28	PCB 27,2,3,6-Trichlorobiphenyl	EPA 8270	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 28/29	PCB 28,2,4,4-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 29/30	PCB 29,2,4,5-Trichlorobiphenyl	EPA 8270	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 30/31	PCB 30,2,4,5-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 31/32	PCB 31,2,4,5-Trichlorobiphenyl	EPA 8270	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 32/33	PCB 32,2,4,5-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 33/34	PCB 33,2,3,4-Trichlorobiphenyl	EPA 8270	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 34/35	PCB 34,2,3,5-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 35/36	PCB 35,3,3,4-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Compound Class	Compound	Serum									
		Solids					Tissue				
		Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 36,3,3,5-Trichlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 37,3,4,4-Trichlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 38,3,4,5-Trichlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 39,3,4,5-Trichlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 4,2-Dichlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 4,10	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
PCB 40,2,2,3,3-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-007	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 41,2,2,3,4-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 41,17,16,6,6,8	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
PCB 42,2,2,3,4-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 42,259	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
PCB 43,2,2,3,5-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 44,2,2,3,5-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-007	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 45,2,2,3,6-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-007	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 46,2,2,3,6-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-007	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y

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				CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS
PCB 59,2,3,3',5-Tetrachlorobiphenyl	EPA 1668	SGS AXYS MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 59,2,3,3',6-Tetrachlorobiphenyl	EPA 8270	SGS AXYS MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 6,2,3-Dichlorobiphenyl	EPA 1668	SGS AXYS MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 60,2,3,4,4'-Tetrachlorobiphenyl	EPA 8270	SGS AXYS MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 61,2,3,4,5-Tetrachlorobiphenyl	EPA 1668	SGS AXYS MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 62,2,3,4,6-Tetrachlorobiphenyl	EPA 8270	SGS AXYS MLA-008	MLA-008	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 64,2,3,4,6-Tetrachlorobiphenyl	EPA 1668	SGS AXYS MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 65,16,6-Tetrachlorobiphenyl	EPA 8270	SGS AXYS MLA-008	MLA-008	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 67,2,3,4,5-Tetrachlorobiphenyl	EPA 1668	SGS AXYS MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 68,2,3,4,5-Tetrachlorobiphenyl	EPA 1668	SGS AXYS MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 69,2,3,4,5-Tetrachlorobiphenyl	EPA 1668	SGS AXYS MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 7,2,4-Dichlorobiphenyl	EPA 1668	SGS AXYS MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Compound Class	Compound	Serum										Solids									
		Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	CALA	Urine	CALA	Water	ANAB DoD **
PCB 7/9	PCB 7,2,3',4,5-Tetrachlorobiphenyl	EPA 1668 SGS AXYS MLA-010 SGS AXYS MLA-210 SGS AXYS MLA-908 EPA 8270 MLA-007	MLA-010 MLA-010 MLA-210 MLA-908 MLA-007	Y Y Y Y Y																	
PCB 70/76	PCB 71,2,3,4,6-Tetrachlorobiphenyl	EPA 1668 SGS AXYS MLA-010 SGS AXYS MLA-210 SGS AXYS MLA-908 EPA 8270 MLA-007	MLA-010 MLA-010 MLA-210 MLA-908 MLA-007	Y Y Y Y Y																	
PCB 71,2,3,4,5,5-Tetrachlorobiphenyl	PCB 71,2,3,4,5,5-Tetrachlorobiphenyl	EPA 1668 SGS AXYS MLA-010 SGS AXYS MLA-210 SGS AXYS MLA-908 EPA 8270 MLA-007	MLA-010 MLA-010 MLA-210 MLA-908 MLA-007	Y Y Y Y Y																	
PCB 73,2,3,5,6-Tetrachlorobiphenyl	PCB 73,2,3,5,6-Tetrachlorobiphenyl	EPA 1668 SGS AXYS MLA-010 SGS AXYS MLA-210 SGS AXYS MLA-908 EPA 1668 MLA-010	MLA-010 MLA-010 MLA-210 MLA-908 MLA-010	Y Y Y Y Y																	
PCB 74,2,4,4,5-Tetrachlorobiphenyl	PCB 74,2,4,4,5-Tetrachlorobiphenyl	EPA 1668 SGS AXYS MLA-010 SGS AXYS MLA-210 SGS AXYS MLA-908 EPA 1668 MLA-010	MLA-010 MLA-010 MLA-210 MLA-908 MLA-010	Y Y Y Y Y																	
PCB 75,2,3,4,6-Tetrachlorobiphenyl	PCB 75,2,3,4,6-Tetrachlorobiphenyl	EPA 1668 SGS AXYS MLA-010 SGS AXYS MLA-210 SGS AXYS MLA-908 EPA 1668 MLA-010	MLA-010 MLA-010 MLA-210 MLA-908 MLA-010	Y Y Y Y Y																	
PCB 76,2,3,4,5-Tetrachlorobiphenyl	PCB 76,2,3,4,5-Tetrachlorobiphenyl	EPA 1668 SGS AXYS MLA-010 SGS AXYS MLA-210 SGS AXYS MLA-908 EPA 1668 MLA-010	MLA-010 MLA-010 MLA-210 MLA-908 MLA-010	Y Y Y Y Y																	
PCB 77,3,3,4,4-Tetrachlorobiphenyl	PCB 77,3,3,4,4-Tetrachlorobiphenyl	EPA 1668 SGS AXYS MLA-010 SGS AXYS MLA-210 SGS AXYS MLA-908 EPA 1668 MLA-010	MLA-010 MLA-010 MLA-210 MLA-908 MLA-010	Y Y Y Y Y																	
PCB 78,3,3,4,4-Tetrachlorobiphenyl	PCB 78,3,3,4,4-Tetrachlorobiphenyl	EPA 1668 SGS AXYS MLA-010 SGS AXYS MLA-210 SGS AXYS MLA-908 EPA 1668 MLA-010	MLA-010 MLA-010 MLA-210 MLA-908 MLA-010	Y Y Y Y Y																	
PCB 8/5	PCB 8,2,4-Dichlorobiphenyl	EPA 1668 SGS AXYS MLA-007 SGS AXYS MLA-010 SGS AXYS MLA-210 SGS AXYS MLA-908 EPA 8270 MLA-007	MLA-010 MLA-010 MLA-210 MLA-908 MLA-007	Y Y Y Y Y																	
PCB 80,3,3,5,5-Tetrachlorobiphenyl	PCB 80,3,3,5,5-Tetrachlorobiphenyl	EPA 1668 SGS AXYS MLA-010 SGS AXYS MLA-210 SGS AXYS MLA-908 EPA 1668 MLA-010	MLA-010 MLA-010 MLA-210 MLA-908 MLA-010	Y Y Y Y Y																	
PCB 80/5	PCB 80,5	EPA 1668 SGS AXYS MLA-007 SGS AXYS MLA-010 SGS AXYS MLA-210 SGS AXYS MLA-908 EPA 8270 MLA-007	MLA-010 MLA-010 MLA-210 MLA-908 MLA-007	Y Y Y Y Y																	
SGS AXYS	SGS AXYS	SGS AXYS	SGS AXYS	SGS AXYS	SGS AXYS	SGS AXYS	SGS AXYS	SGS AXYS	SGS AXYS	SGS AXYS	SGS AXYS	SGS AXYS	SGS AXYS	SGS AXYS	SGS AXYS	SGS AXYS	SGS AXYS	SGS AXYS	SGS AXYS	SGS AXYS	SGS AXYS

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum								Solids
				CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Maine DOH	Minnesota DOH	
PCB 81,3,4,5-Tetrachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-007	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 82,2,2,3,3,4-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-007	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 83,2,2,3,3,4-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 83,2,2,3,3,4-Pentachlorobiphenyl	EPA 8270	MLA-007	SGS AXYS MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 84,2,2,3,3,6-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Tissue
	EPA 8270	MLA-007	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 85,2,2,3,3,4-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 85,2,2,3,3,4,5-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 85,120	EPA 8270	MLA-007	SGS AXYS MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 86,2,2,3,4,5-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Urine
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 87,115,116	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 88,2,2,3,4,6-Pentachlorobiphenyl	EPA 8270	MLA-007	SGS AXYS MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 88,121	EPA 8270	MLA-007	SGS AXYS MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Water
PCB 89,2,2,3,4,6-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 9,2,5-Dichlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 90,2,2,3,4,5-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 91,2,2,3,4,6-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Water, Non-Potable
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 92,2,2,3,5,5-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-007	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 93,2,2,3,5,6-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	AFFF
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
ACC-103 Rev. 53, 26-Jun-2020	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	ANAB DoD **
ACC-103 Rev. 53, 26-Jun-2020	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	ANAB ISO 17025

Accreditation Scope
SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 50

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file ref.: ACC-101 Rev. 50

Compound Class	Compound	Serum										Solid									
		Alaska DEC					ANAB DoD **					ANAB ISO 17025					CALA				
PPCP	Benzodiazepine (BZD)	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Pentoxifylline (PTX)	SGS AXYS MLA-110	MLA-110	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Penturoniumbromide (PBu)	SGS AXYS MLA-060	MLA-060	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	1,7-Dimethylxanthine	SGS AXYS MLA-041	MLA-041	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	10-hydroxy-amitriptyline	SGS AXYS MLA-043	MLA-043	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	2-hydroxy-tuboprofen	SGS AXYS MLA-042	MLA-042	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	4-Epianhydrotetracycline (EATC)	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	4-Epichlorotetracycline (ECTC)	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	4-Epoxycetacycline (EOTC)	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	4-Epioxytetacycline (ETC)	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	4-Epiotriacycline (ETC)	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Acetaminophen	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Albuterol	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Alprazolam	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Amantadine	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Amphetamine	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Antarachinotetracycline (ACTC)	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Antihistamine (ATC)	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Antipyrine	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Antrodialin	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Acetaminophen	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Benzoylceponine	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Benzotrizone	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Betaethonium	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Bisphenol A	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Caffeine	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Cathartex	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Carbamazepine	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Cefotaxime	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Chlortetracycline (CTC)	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Cineididine	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Ciprofloxacin	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Clarithromycin	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Citaloxacin	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Cotinine	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	DEET (N,N-diethyl-m-toluamide)	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Dehydroretifoline	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Cocaine	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Codine	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Dapsone	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Desmethylketamine	SGS AXYS MLA-075	MLA-075	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Compound Class	Compound	Accredited Method ID		CALA	Serum
		SGS AXYS MLA-075	MLA-075		
Diazepam		EPA 16.94	MLA-075	Y	Y
Digoxin		EPA 16.94	MLA-075	Y	Y
Diltiazem		EPA 16.94	MLA-075	Y	Y
Diphenhydramine		EPA 16.94	MLA-075	Y	Y
Dowycaine		EPA 16.94	MLA-075	Y	Y
Eralapril		EPA 16.94	MLA-075	Y	Y
Enrofloxacin		EPA 16.94	MLA-075	Y	Y
Erythromycin		EPA 16.94	MLA-075	Y	Y
Erythromycin azuolate		EPA 16.94	MLA-075	Y	Y
Flumequine		EPA 16.94	MLA-075	Y	Y
Fluconazole		EPA 16.94	MLA-075	Y	Y
Fluoxetine		EPA 16.94	MLA-075	Y	Y
Fluticasone propionate		EPA 16.94	MLA-075	Y	Y
Furosemide		EPA 16.94	MLA-075	Y	Y
Gemfibrozil		EPA 16.94	MLA-075	Y	Y
Glipizide		EPA 16.94	MLA-075	Y	Y
Glibenclamide		EPA 16.94	MLA-075	Y	Y
Hydrochlorothiazide		EPA 16.94	MLA-075	Y	Y
Hydrocodone		EPA 16.94	MLA-075	Y	Y
Hydrocortisone		EPA 16.94	MLA-075	Y	Y
Ibuprofen		EPA 16.94	MLA-075	Y	Y
Ischionotetacycline (ICTC)		EPA 16.94	MLA-075	Y	Y
Lincosycin		EPA 16.94	MLA-075	Y	Y
Lomefloxacin		EPA 16.94	MLA-075	Y	Y
Meprobamate		EPA 16.94	MLA-075	Y	Y
Mefenamic acid		EPA 16.94	MLA-075	Y	Y
Methylprednisolone		EPA 16.94	MLA-075	Y	Y
Methotrexate		EPA 16.94	MLA-075	Y	Y
Miconazole		EPA 16.94	MLA-075	Y	Y
Minoxidil		EPA 16.94	MLA-075	Y	Y
Naproxen		EPA 16.94	MLA-075	Y	Y
Nonoxokin		EPA 16.94	MLA-075	Y	Y
Norfluroxine		EPA 16.94	MLA-075	Y	Y
Norgestimimate		EPA 16.94	MLA-075	Y	Y
Nonverapamil		EPA 16.94	MLA-075	Y	Y
Oroxacin		EPA 16.94	MLA-075	Y	Y
Ometoprim		EPA 16.94	MLA-075	Y	Y
Oxacillin		EPA 16.94	MLA-075	Y	Y
Oxalic acid		EPA 16.94	MLA-075	Y	Y
Oxydone		EPA 16.94	MLA-075	Y	Y
Oxotetracycline (OTC)		EPA 16.94	MLA-075	Y	Y
Paroxetine		EPA 16.94	MLA-075	Y	Y
Penicillin G		EPA 16.94	MLA-075	Y	Y
Penicillin V		EPA 16.94	MLA-075	Y	Y

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Serum
Prednisolone		SGS AXYS MLA-075	MLA-075	Alaska DEC ANAB DoD ** ANAB ISO 17025	Solids
Prednisone		SGS AXYS MLA-075	MLA-075	CALA	
Promethazine		SGS AXYS MLA-075	MLA-075	California WB	
Propoxyphene		SGS AXYS MLA-075	MLA-075	Florida DOH	
Propriofenol		SGS AXYS MLA-075	MLA-075	Maine DOH	
Ranitidine	EPA 1694	MLA-075	MLA-075	Minnesota DOH	
Roxithromycin	EPA 1694	MLA-075	MLA-075	New Jersey DEP	
Sabatoxacin	EPA 1694	MLA-075	MLA-075	New York DOH	
Sertindole		SGS AXYS MLA-075	MLA-075	Virginia DGS	
Simvastatin		SGS AXYS MLA-075	MLA-075	Washington DE	
Sulfachloropyridazine		SGS AXYS MLA-075	MLA-075	ANAB DoD ** ANAB ISO 17025	Tissue
Sulfadiazine	EPA 1694	MLA-075	MLA-075	CALA	Urine
Sulfamethizole		SGS AXYS MLA-075	MLA-075	CALA	Water
Sulfadimethoxine	EPA 1694	MLA-075	MLA-075	Alaska DEC ANAB DoD ** ANAB ISO 17025	Water, Non-Potable
Sulfamerazine	EPA 1694	MLA-075	MLA-075	CALA	
Sulfameturazine	EPA 1694	MLA-075	MLA-075	California WB	
Sulfameturamide	EPA 1694	MLA-075	MLA-075	Florida DOH	
Sulfathiazole	EPA 1694	MLA-075	MLA-075	Maine DOH	
Sulfamethoxazole	EPA 1694	MLA-075	MLA-075	Minnesota DOH	
Sulfamerazine	EPA 1694	MLA-075	MLA-075	New Jersey DEP	
Sulfameturamide	EPA 1694	MLA-075	MLA-075	New York DOH	
Sulfathiazole	EPA 1694	MLA-075	MLA-075	Virginia DGS	
Tetracycline (TC)	EPA 1694	MLA-075	MLA-075	Washington DE	
Thiophendione		SGS AXYS MLA-075	MLA-075	ANAB DoD ** ANAB ISO 17025	
Thiobendazole		SGS AXYS MLA-075	MLA-075	CALA	
Trematolone	EPA 1694	MLA-075	MLA-075	Florida DOH	
Trembolone acetate		SGS AXYS MLA-075	MLA-075	Minnesota DOH	
Triamterene		SGS AXYS MLA-075	MLA-075	New Jersey DEP	
Tridoctran	EPA 1694	MLA-075	MLA-075	New York DOH	
Triobsan	EPA 1694	MLA-075	MLA-075	Pennsylvania DEP	
Trimethoprim	EPA 1694	MLA-075	MLA-075	Virginia DGS	
Tyrosin	EPA 1694	MLA-075	MLA-075	Washington DE *	
Vasartan		SGS AXYS MLA-075	MLA-075	ANAB DoD ** ANAB ISO 17025	AFFF
Vegetamine		SGS AXYS MLA-075	MLA-075		
Virginiamycin	EPA 1694	MLA-075	MLA-075		
Warfarin	EPA 1694	MLA-075	MLA-075		
Targeted Metabolites	11-14, 17-eicosatetenoic acid (eicosatrienoic acid)	SGS AXYS MLA-075	MLA-075		
	11,14-eicosadienoic acid	SGS AXYS MLA-001	MLM-001		
	3-hydroxyvitroline	SGS AXYS MLA-001	MLM-001		
	Acetylornithine	SGS AXYS MLA-001	MLM-001		
	Alanine	SGS AXYS MLA-001	MLM-001		
	alpha-Aminoadipic acid	SGS AXYS MLA-001	MLM-001		
	Arginine	SGS AXYS MLA-001	MLM-001		
	Asparagine	SGS AXYS MLA-001	MLM-001		
	Aspartate	SGS AXYS MLA-001	MLM-001		
	Asymmetric dimethylarginine	SGS AXYS MLA-001	MLM-001		
	Butyrylcaprolactone	SGS AXYS MLA-001	MLM-001		
	Butyrylcarnitine	SGS AXYS MLA-001	MLM-001		
	C22:8 ISOMER 1 (tentatively all-cis-4, 8, 12, 15, 19-docosapentaenoic acid)	SGS AXYS MLA-001	MLM-001		
	C22:8 ISOMER 2 (all-cis-7, 10, 13, 16-docosapentaenoic acid (DPA))	SGS AXYS MLA-001	MLM-001		
	C22:8 ISOMER 3 (tentatively all-cis-4, 7, 10, 13, 16-docosapentaenoic acid)	SGS AXYS MLA-001	MLM-001		
	Carnitine	SGS AXYS MLA-001	MLM-001		
	Carnosine	SGS AXYS MLA-001	MLM-001		
	Carnosoycarnitine	SGS AXYS MLA-001	MLM-001		
	Carnosylcarnitine	SGS AXYS MLA-001	MLM-001		
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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Serum
Chlorine	Choline	SGS AXYS MLM-001	MLM-001	Y	
Decanoyl carnitine		SGS AXYS MLM-001	MLM-001	Y	
Decanoyl carnitine		SGS AXYS MLM-001	MLM-001	Y	
Decenoyl carnitine		SGS AXYS MLM-001	MLM-001	Y	
Docosahexaenoic acid (DHA)		SGS AXYS MLM-001	MLM-001	Y	
Docosahexaenoic acid (generic acid)		SGS AXYS MLM-001	MLM-001	Y	
Dodecanoylethanolamine		SGS AXYS MLM-001	MLM-001	Y	
Dodecanoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Dopamine		SGS AXYS MLM-001	MLM-001	Y	
Eicosapentaenoic acid (EPA)		SGS AXYS MLM-001	MLM-001	Y	
Eicosatetraenoic acid (arachidonic acid)		SGS AXYS MLM-001	MLM-001	Y	
Eicosatrienoic acid (linoleo- α -linolenic acid)		SGS AXYS MLM-001	MLM-001	Y	
Glyceroxy carnitine		SGS AXYS MLM-001	MLM-001	Y	
Glutamate		SGS AXYS MLM-001	MLM-001	Y	
Glutaryl carnitine (Hydroxyhexanoylcarnitine)		SGS AXYS MLM-001	MLM-001	Y	
Glycine		SGS AXYS MLM-001	MLM-001	Y	
Glycerothiocrotonyl carnitine		SGS AXYS MLM-001	MLM-001	Y	
Glycolic acid		SGS AXYS MLM-001	MLM-001	Y	
Glycodeoxycholic acid		SGS AXYS MLM-001	MLM-001	Y	
Hexadecenoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Heptadecanoic acid (palmitic acid)		SGS AXYS MLM-001	MLM-001	Y	
Heptadecenoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Heptadecenoic acid (palmitoleic acid)		SGS AXYS MLM-001	MLM-001	Y	
Heptadecenoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Heptadecenoylcarnitine (fumaryl)carnitine		SGS AXYS MLM-001	MLM-001	Y	
Hexenoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Hexose (sum isomers)		SGS AXYS MLM-001	MLM-001	Y	
Histamine		SGS AXYS MLM-001	MLM-001	Y	
Histidine		SGS AXYS MLM-001	MLM-001	Y	
Hydroxyhexadecenoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Hydroxymyristeoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Hydroxysphingomyeline C14:1		SGS AXYS MLM-001	MLM-001	Y	
Hydroxysphingomyeline C16:1		SGS AXYS MLM-001	MLM-001	Y	
Hydroxysphingomyeline C22:1		SGS AXYS MLM-001	MLM-001	Y	
Hydroxysphingomyeline C24:1		SGS AXYS MLM-001	MLM-001	Y	
Hydroxystetradecenoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Hydroxystearoylcarnitine (Methylstearoylcarnitine)		SGS AXYS MLM-001	MLM-001	Y	
Kynureine		SGS AXYS MLM-001	MLM-001	Y	
Leucine		SGS AXYS MLM-001	MLM-001	Y	
Lithocholic acid		SGS AXYS MLM-001	MLM-001	Y	
Lysine		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C14:0		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C16:0		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C16:1		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C17:0		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C18:0		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C18:1		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C18:2		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C20:3		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C24:0		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C26:1		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C28:0		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C28:1		SGS AXYS MLM-001	MLM-001	Y	
Methionine		SGS AXYS MLM-001	MLM-001	Y	
Methionylsulfoxide		SGS AXYS MLM-001	MLM-001	Y	
Methylglycine/carnitine		SGS AXYS MLM-001	MLM-001	Y	
Nicotinamide		SGS AXYS MLM-001	MLM-001	Y	
Norvaline/carnitine		SGS AXYS MLM-001	MLM-001	Y	

Accreditation Scope		SGS AXYS Analytical Services Ltd.		file ref.: ACC-101 Rev. 50	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Serum
Octadecenoic acid (linoleic acid)	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Alaska DEC ANAB DoD ** ANAB ISO 17025	Solids
Octadecenyl carnitine	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	CALA	
Octadecanoic acid (stearic acid)	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	California WB	
Oleateaminoaceticline	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Florida DOH	
Octadecenoic acid (γ -linolenic acid)	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Maine DOH	
Ornithine	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Minnesota DOH	
Oxaloacetyl carnitine	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	New Jersey DEP	
Phenylalanine	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	New York DOH	
Phenylalanylamine	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Virginia DGS	
Phosphatidylcholine acyl-alkyl C30:0	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Washington DE	
Phosphatidylcholine acyl-alkyl C30:2	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	ANAB DoD ** ANAB ISO 17025	Tissue
Phosphatidylcholine acyl-alkyl C32:2	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	CALA	
Phosphatidylcholine acyl-alkyl C34:0	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Florida DOH	
Phosphatidylcholine acyl-alkyl C34:1	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Minnesota DOH	
Phosphatidylcholine acyl-alkyl C34:2	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	New Jersey DEP	
Phosphatidylcholine acyl-alkyl C34:3	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Virginia DGS	
Phosphatidylcholine acyl-alkyl C35:0	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Washington DE	
Phosphatidylcholine acyl-alkyl C36:0	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	ANAB DoD ** ANAB ISO 17025	Urine
Phosphatidylcholine acyl-alkyl C36:2	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	CALA	
Phosphatidylcholine acyl-alkyl C38:3	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Water	
Phosphatidylcholine acyl-alkyl C38:4	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Alaska DEC ANAB DoD ** ANAB ISO 17025	Water, Non-Potable
Phosphatidylcholine acyl-alkyl C38:5	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	CALA	
Phosphatidylcholine acyl-alkyl C38:6	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Florida DOH	
Phosphatidylcholine diacyl C32:1	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Maine DOH	
Phosphatidylcholine diacyl C32:2	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Minnesota DOH	
Phosphatidylcholine diacyl C32:3	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	New Jersey DEP	
Phosphatidylcholine diacyl C34:1	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	New York DOH	
Phosphatidylcholine diacyl C34:2	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Pennsylvania DEP	
Phosphatidylcholine diacyl C34:3	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Virginia DGS	
Phosphatidylcholine diacyl C32:0	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Washington DE *	
Phosphatidylcholine diacyl C34:4	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	ANAB DoD ** ANAB ISO 17025	AFFF
Phosphatidylcholine diacyl C32:1	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	CALA	
Phosphatidylcholine diacyl C32:2	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Water	
Phosphatidylcholine diacyl C32:3	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Alaska DEC ANAB DoD ** ANAB ISO 17025	
Phosphatidylcholine diacyl C36:3	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	CALA	
Phosphatidylcholine diacyl C36:4	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Florida DOH	
Phosphatidylcholine diacyl C36:5	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Maine DOH	
Phosphatidylcholine diacyl C36:6	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Minnesota DOH	
Phosphatidylcholine diacyl C38:1	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	New Jersey DEP	
Phosphatidylcholine diacyl C38:2	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	New York DOH	
Phosphatidylcholine diacyl C38:3	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Pennsylvania DEP	
Phosphatidylcholine diacyl C38:4	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Virginia DGS	
Phosphatidylcholine diacyl C38:5	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	Washington DE *	
Phosphatidylcholine diacyl C38:6	SGS AXYS MM-M-001	SGS AXYS MM-M-001	Y	ANAB DoD ** ANAB ISO 17025	

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Serum
	Phosphatidylserine diacyl C4:0:1	SGS AXYS MLA-001	MLA-001	Alaska DEC ANAB DoD ** ANAB ISO 17025	Solids
	Phosphatidylserine diacyl C4:0:2	SGS AXYS MLA-001	MLA-001	CALA	
	Phosphatidylserine diacyl C4:0:3	SGS AXYS MLA-001	MLA-001	California WB	
	Phosphatidylserine diacyl C4:0:4	SGS AXYS MLA-001	MLA-001	Florida DOH	
	Phosphatidylserine diacyl C4:0:5	SGS AXYS MLA-001	MLA-001	Maine DOH	
	Phosphatidylserine diacyl C4:0:6	SGS AXYS MLA-001	MLA-001	Minnesota DOH	
	Phosphatidylserine diacyl C4:2:0	SGS AXYS MLA-001	MLA-001	New Jersey DEP	
	Phosphatidylserine diacyl C4:2:1	SGS AXYS MLA-001	MLA-001	New York DOH	
	Phosphatidylserine diacyl C4:2:2	SGS AXYS MLA-001	MLA-001	Virginia DGS	
	Phosphatidylserine diacyl C4:2:4	SGS AXYS MLA-001	MLA-001	Washington DE	
	Phosphatidylserine diacyl C4:2:5	SGS AXYS MLA-001	MLA-001	ANAB DoD **	Tissue
	Phosphatidylserine diacyl C4:2:6	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Phimeloyamine	SGS AXYS MLA-001	MLA-001	CALA	Urine
	Proline	SGS AXYS MLA-001	MLA-001	CALA	Water
	Propionylcamitine	SGS AXYS MLA-001	MLA-001	Alaska DEC ANAB DoD ** ANAB ISO 17025	Water, Non-Potable
	Propionylcamitine	SGS AXYS MLA-001	MLA-001	ANAB DoD **	AFFF
	Putrescine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Sarcosine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Serine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Serotonin	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Spermidine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Spermine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C16:0	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C16:1	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C18:0	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C18:1	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C20:2	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C22:3	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C24:0	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C24:1	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C26:0	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C26:1	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Symmetric dimethylarginine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Taurine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Tauromechanoxylic acid	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Taurotropic acid	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Taurodeoxycholic acid	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Taurolithocholic acid	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Tauroxodeoxycholic acid	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Tetra-acetylmethylamine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Tetradecanoic acid (myrist acid)	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Tetradecenoic camitine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Tetradecenoic camitine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Theanine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Tiglycamidine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Total methylnigamine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Tryptophan	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Tyrosine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Ursodeoxycholic acid	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Valericamidine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Valine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
TOP		SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Perflurobutanesulfonate (PFBS)	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Perflurobutanoate (PFBA)	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Perflurobutenonsulfonate (PFDS)	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Perflurodecane (PFDA)	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Perflurodecaesulfonate (PFDS)	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Perfluorooctanesulfonate (PFOSA)	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Perfluorooctanesulfonate (PFHs)	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Perfluorooctanoate (PFCA)	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Perfluoroperfluorooctane (PFPeO)	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Perfluoroperfluorooctane (PFPe)	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Perfluorooctane (PFCA)	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Perfluorooctane (PFPeA)	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Perfluorooctane (PFUnA)	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
Note *	Analysis of PFASs in non-potable water samples by SGS AXYS method MLA-007, with the exception of NPDES or State permitted discharges and Stormwater applications, may fall within the scope of Washington State Department of Ecology solids matrix accreditation, subject to approval of the Ecology Project Manager.				

Compound Class	Compound	Note **	Accredited Method ID	SGS AXYS Method ID	
Y	Accreditation scope				
AFFF	Aqueous film forming foam				
BFR	Brominated flame retardants (non-PBDE)				
BPA and mPE	Bisphenol A and mono-Phthalate Esters				
OC Pesticides	Organochlorine Pesticides				
PAH	Polyaromatic Hydrocarbons				
PBDE	Polybrominated diphenyl ethers				
PCB	Polychlorinated Biphenyls				
PCDD/F	Polychlorinated dibenzodioxins/furans				
PFAS	Per- and Polyfluorinated Substances				
PPCP	Pharmaceutical and Personal Care Products				
TOP	Total Oxidizable Precursors				
California WB	California Water Boards, Lab ID 2911				
Florida DOH	Florida Department of Health, Lab ID EB71007, (NELAC Standard)				
Pennsylvania DEP	Pennsylvania Department of Environmental Protection				
Minnesota DOH	Minnesota Department of Health, Lab ID 232-999-4370, (NELAC Standard)				
New Jersey DEP	New Jersey Department of Environmental Protection, Lab ID CAN405, (NELAC Standard)				
New York DOH	New York Department of Health, Lab ID 11674, (NELAC Standard)				
Washington DE	Washington Department of Ecology, Lab ID 460224, (NELAC Standard)				
Virginia DGS	Virginia Department of General Services, Division of Consolidated Laboratory Services, Lab ID 17-014				
Alaska DEC	Alaska Department of Environmental Conservation, Contaminated Sites laboratory Approval 17-014				
Maine DOH	Maine Center for Disease Control and Prevention, Department of Health and Human Services, Lab ID CN00003				
CALA	Serum				
Alaska DEC	Solids				
ANAB DoD **					
ANAB ISO 17025					
CALA					
California WB					
Florida DOH					
Maine DOH					
Minnesota DOH					
New Jersey DEP					
New York DOH					
Virginia DGS					
Washington DE					
ANAB DoD **	Tissue				
ANAB ISO 17025					
CALA					
Florida DOH					
Minnesota DOH					
New Jersey DEP					
Virginia DGS					
CALA	Urine				
CALA	Water				
Alaska DEC	Water, Non-Potable				
ANAB DoD **					
ANAB ISO 17025					
CaliforniWB					
Florida DOH					
Maine DOH					
Minnesota DOH					
New Jersey DEP					
New York DOH					
Pennsylvania DEP					
Virginia DGS					
Washington DE *					
ANAB DoD **	AFFF				
ANAB ISO 17025					

ANAB DoD

ANSI National Accreditation Board, certificate ADE-1861, (US DoD QSM 5.3 Standard)

CALA

Canadian Association for Laboratory Accreditation Inc., Lab ID A2637, (ISO/IEC 17025:2017 Standard)



Testing
Accreditation No. A2637



2045 Mills Road West

TEL: (250) 655-5800

Sidney, BC, Canada V8L5X2

TOLL-FREE: 1-888-373-0881

SGS AXYS Client No.: 4066

Client Address: Tetra Tech, Inc. - Pacific Guardian Ctr.
 737 Bishop St., Suite 2340, Mauka Tower
 Honolulu, HI, US, 96813-3201

The SGS AXYS contact for these data is Dale Robinson.

"This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein."

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"The sample(s) to which the findings recorded herein (the "Findings") relate was[were] drawn and [or] provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is[are] said to be extracted."

BATCH SUMMARY

Batch ID:	WG72538	Date:	22-Jul-2020
Analysis Type:	Perfluorinated Organic and FTS	Matrix Type:	Tissue

BATCH MAKEUP

Contract:	4066	Blank:	WG72538-101
Samples:	L33107-29 L33107-30 L33107-31 L33107-32 L33107-33 L33107-34 L33107-35 L33107-36 L33107-37 L33107-38 L33107-39 L33107-40 L33107-41 L33107-42	Site 12 Marine Corps Far Fish #2 Site 12 Marine Corps Far Fish #3 Site 11 Landfill Fish #1 Site 11 Landfill Fish #2 Site 11 Landfill Fish #3 Site 13 K North Fish #1 Site 13 K North Fish #2 Site 13 K North Fish #3 Site 14 Kahuku Fish #1 Site 14 Kahuku Fish #2 Site 14 Kahuku Fish #3 Site 15 Haleiwa Fish #1 Site 15 Haleiwa Fish #2 Site 15 Haleiwa Fish #3	Reference or Spike: WG72538-102 WG72538-103
			Duplicate:

Comments:

1. Data are considered final.
2. The analyte 6:2 FTS was detected in the Lab Blank (SGS AXYS ID: WG72538-101). Data are not blank corrected. Blank data should be taken into consideration when evaluating sample data.
3. Blank data should be evaluated against specifications using the same blank sample size as the size of the client samples.
4. Percent recovery of analyte N-EtFOSE in the OPR (SGS AXYS ID: WG72538-102) was below the method nominal limit and was flagged with an 'N'. Sample data may be similarly affected.
5. Percent recovery of several labeled compounds in several client samples were outside the method nominal limit and were flagged with a 'V'. As the isotope dilution method of quantification produces data that are recovery corrected, the variances from the method acceptance criteria are deemed not to affect the quantification of the analytes. Percent labeled compound recoveries are used as a general method performance indicator only.



CHAIN OF CUSTODY

2045 Mills Road West TEL: (250) 655-5800 TOLL FREE 1-888-373-0881
 Sidney, British Columbia, Canada V8L 5X2 FAX: (250) 655-5811

SGS AXYS CLIENT #: 4066

REPORT TO:

Company Address		TO: Company Address		INVOICE		ANALYSIS REQUESTED	
Hawaii Pacific University	41-202 Kālamianole Hwy, Ste 9	Tera Tech, Inc. Honolulu	737 Bishop St., Suite 2340				
Waimanalo, HI 96795		Pacific Guardian Center, Mauka Tower	Honolulu, HI 96813-3201				
Contact	Jennifer Lynch	Contact	Eric Jensen				
Phone	808-236-3582 or 843-442-2188	Phone	808-441-4784				
FAX		FAX	808-536-3953				
E-mail	Jnllynch@hpu.edu	E-mail	eric.jensen@tetratech.com				
Project Name/Number:	Perfluoroalkyl substance (PFAS) concentrations in fillets of nearshore Hawaiian reef fish caught in subsistence fisheries (HI DOH HPU)	Sampler's Name:	Natasha Sawickij				
Client Sample Identification	Sampling Date	Sampling Time	Container Type/No.	SGS AXYS Lab Sample ID (Lab use only)	MLA-110 (UPLC-MS/MS)		
Site 1 Kailua WWTP Fish #1	Matrix	Nov 3 2019	9:20 AM	50 mL PP tube	L33107-1	Fish Tissue samples	
Site 1 Kailua WWTP Fish #2	Homogenized fish muscle	Nov 3 2019	9:38 AM	50 mL PP tube	-2	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 1 Kailua WWTP Fish #3	Homogenized fish muscle	Nov 3 2019	11:25 AM	50 mL PP tube	-3	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 3 Ewa Beach Fish # 1	Homogenized fish muscle	Dec 15 2019	morning	50 mL PP tube	-4	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 3 Ewa Beach Fish # 2	Homogenized fish muscle	Feb 22 2020	morning	50 mL PP tube	-5	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 3 Ewa Beach Fish # 3	Homogenized fish muscle	Mar 21 2020	11:25 AM	50 mL PP tube	-6	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 4 Ala Wai Fish # 1	Homogenized fish muscle	Nov 15 2019	12:28 PM	50 mL PP tube	-7	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 4 Ala Wai Fish # 2	Homogenized fish muscle	Nov 15 2019	12:37 PM	50 mL PP tube	-8	MLA-110 (UPLC-MS/MS)	Fish Tissue samples
Site 4 Ala Wai Fish # 3	Homogenized fish muscle	Nov 15 2019	12:44 PM	50 mL PP tube	-9	MLA-110 (UPLC-MS/MS)	Fish Tissue samples

received by: Jennifer Lynch

20 May 2020

10:35

Site 9 Bellows Fish #1	Homogenized fish muscle	Feb 23 2020	11:30 AM	50 mL PP tube	L33107-10	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 9 Bellows Fish #2	Homogenized fish muscle	Feb 23 2020	11:30 AM	50 mL PP tube	-11	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 9 Bellows Fish #3	Homogenized fish muscle	Mar 22 2020	Morning	50 mL PP tube	-12	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 5 Honolulu Harbor Fish #1	Homogenized fish muscle	Nov 15 2019	2:35 PM	50 mL PP tube	-13	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 5 Honolulu Harbor Fish #2	Homogenized fish muscle	Nov 15 2019	2:40PM	50 mL PP tube	-14	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 5 Honolulu Harbor Fish #3	Homogenized fish muscle	Dec 15 2019	2:40PM	50 mL PP tube	-15	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 7 Pearl Harbor Fish #1	Homogenized fish muscle	Feb 22 2020	1:30 PM	50 mL PP tube	-16	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 7 Pearl Harbor Fish #2	Homogenized fish muscle	Feb 22 2020	1:30 PM	50 mL PP tube	-17	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 7 Pearl Harbor Fish #3	Homogenized fish muscle	Feb 22 2020	2:00 PM	50 mL PP tube	-18	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 6 Ahuimanu Fish #1	Homogenized fish muscle	Mar 12 2020	10:45 AM	50 mL PP tube	-19	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 6 Ahuimanu Fish #2	Homogenized fish muscle	Mar 12 2020	10:55 AM	50 mL PP tube	-20	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 6 Ahuimanu Fish #3	Homogenized fish muscle	Apr 11 2020	10:15 AM	50 mL PP tube	-21	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 10 K South Fish #1	Homogenized fish muscle	Mar 3 2020	2:10 PM	50 mL PP tube	-22	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 10 K South Fish #2	Homogenized fish muscle	Mar 3 2020	2:15 PM	50 mL PP tube	-23	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 10 K South Fish #3	Homogenized fish muscle	Mar 3 2020	2:20 PM	50 mL PP tube	-24	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 8 Hawaii Kai Fish #1	Homogenized fish muscle	Apr 13 2020	9:00 PM	50 mL PP tube	-25	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 8 Hawaii Kai Fish #2	Homogenized fish muscle	Apr 13 2020	9:00 PM	50 mL PP tube	-26	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 8 Hawaii Kai Fish #3	Homogenized fish muscle	Apr 13 2020	9:00 PM	50 mL PP tube	-27	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 12 Marine Corps Far Fish #1	Homogenized fish muscle	Mar 12 2020	12:50 PM	50 mL PP tube	-28	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 12 Marine Corps Far Fish #2	Homogenized fish muscle	Apr 11 2020	9:20 AM	50 mL PP tube	-29	MLA-110 (UPLC-MS/MS) Fish Tissue samples

Received by: Jennifer Carlson 20 May 2020 10:35

Site 12 Marine Corps Far Fish #3	Homogenized fish muscle	Apr 11 2020	9:30 AM	50 mL PP tube	L 33107 - 30	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 11 Landfill Fish #1	Homogenized fish muscle	Mar 3 2020	4:25 PM	50 mL PP tube	- 31	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 11 Landfill Fish #2	Homogenized fish muscle	Apr 29 2020	1:00 PM	50 mL PP tube	- 32	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 11 Landfill Fish #3	Homogenized fish muscle	Apr 29 2020	12:10 PM	50 mL PP tube	- 33	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 13 K North Fish #1	Homogenized fish muscle	May 7 2020	10:40 AM	50 mL PP tube	- 34	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 13 K North Fish #2	Homogenized fish muscle	May 7 2020	10:50 AM	50 mL PP tube	- 35	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 13 K North Fish #3	Homogenized fish muscle	May 7 2020	10:40 AM	50 mL PP tube	- 36	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 14 Kahuku Fish #1	Homogenized fish muscle	May 13 2020	11:07 AM	50 mL PP tube	- 37	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 14 Kahuku Fish #2	Homogenized fish muscle	May 13 2020	12:15 PM	50 mL PP tube	- 38	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 14 Kahuku Fish #3	Homogenized fish muscle	May 13 2020	10:45 AM	50 mL PP tube	- 39	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 15 Haleiwa Fish #1	Homogenized fish muscle	May 7 2020	1:50 PM	50 mL PP tube	- 40	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 15 Haleiwa Fish #2	Homogenized fish muscle	May 7 2020	1:55 PM	50 mL PP tube	- 41	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 15 Haleiwa Fish #3	Homogenized fish muscle	May 7 2020	2:00 PM	50 mL PP tube	- 42	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Fish Field Blank 1	Deionized water	Apr 29 2020	morning	50 mL PP tube	L 33105 - 1	MLA-110 (UPLC-MS/MS) Water samples
Fish Field Blank 2	Deionized water	May 7 2020	morning	50 mL PP tube	- 2	MLA-110 (UPLC-MS/MS) Water samples
Fish Field Blank 3	Deionized water	May 13 2020	11:27 AM	50 mL PP tube	- 3	MLA-110 (UPLC-MS/MS) Water samples
Relinquished by (Signature) <i>Jennifer Lynch</i>	Date <u>May 13-2020</u> Time <u>10:35</u>	Received by (Signature) <u>Tonya Andersen</u>	Courier <u>FedEx</u>	Sample Receipt	Wavbill No. <u>see email</u>	
Remarks	Date	Time			Temp °C	Cooler
					Custody Seal #	

SGS AXYS METHOD MLA-110 Rev 02

Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 12 Marine Corps Far Fish
#2
Sample Collection:
11-Apr-2020 09:20

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 09:18:37	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 51
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.792 (L)	
PFPeA	U		0.396 (L)	
PFHxA	U		0.198 (L)	
PFHpA	U		0.198 (L)	
PFOA	U		0.198 (L)	
PFNA	U		0.198 (L)	
PFDA	U		0.198 (L)	
PFUnA	U		0.198 (L)	
PFDoA	U		0.198 (L)	
PFTrDA	U		0.198 (L)	
PFTeDA	U		0.198 (L)	
PFBS	U		0.198 (L)	
PFPeS	U		0.198 (L)	
PFHxS	U		0.198 (L)	
PFHpS	U		0.198 (L)	
PFOS	U		0.198 (L)	
PFNS	U		0.198 (L)	
PFDS	U		0.198 (L)	
PFDoS	U H		0.198 (L)	
4:2 FTS	U		0.792 (L)	
6:2 FTS	B	5.59	0.713 (L)	5:52
8:2 FTS	U		0.792 (L)	
PFOSA	U		0.198 (L)	
N-MeFOSA	U		0.228 (L)	
N-EtFOSA	U		0.495 (L)	
MeFOSAA	U		0.198 (L)	
EtFOSAA	U		0.198 (L)	
N-MeFOSE	U H		1.98 (L)	
N-EtFOSE	U		1.49 (L)	
HFPO-DA	U		0.752 (L)	
ADONA	U		0.792 (L)	
9CI-PF3ONS	U		0.792 (L)	
11CI-PF3OUdS	U		0.792 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; B = analyte found in the associated blank and concentration in sample is less than 10X the concentration in the associated blank; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonso _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 12 Marine Corps Far Fish #2
Sample Collection:
11-Apr-2020 09:20

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-29
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 09:18:37	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 51
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	37.8	94.4	1:49
13C5-PFPeA		20.0	23.9	120	4:24
13C5-PFHxA		10.0	10.2	102	5:00
13C4-PFHpA		10.0	9.57	95.7	5:27
13C8-PFOA		10.0	9.68	96.8	6:10
13C9-PFNA		5.00	4.80	95.9	7:01
13C6-PFDA		5.00	4.70	93.9	7:32
13C7-PFUnA		5.00	4.33	86.6	7:52
13C2-PFDaO		5.00	3.97	79.5	8:07
13C2-PFTeDA	V	5.00	2.35	47.1	8:48
13C3-PFBs		10.0	9.89	98.9	4:57
13C3-PFHxS		10.0	9.53	95.3	6:16
13C8-PFOS		10.0	10.5	105	7:38
13C2-4:2 FTS		20.0	27.1	136	4:53
13C2-6:2 FTS		20.0	16.9	84.7	5:52
13C2-8:2 FTS		20.0	20.1	100	7:22
13C8-PFOSA		10.0	10.5	105	8:43
D3-N-MeFOSA		10.0	4.33	43.3	10:09
D5-N-EtFOSA		10.0	6.44	64.4	10:26
D3-MeFOSAA		20.0	21.2	106	7:35
D5-EtFOSAA		20.0	23.3	116	7:43
d7-NMe-FOSE		100	14.4	14.4	10:01
d9-NEt-FOSE		100	57.1	57.1	10:19
13C3-HFPO-DA		40.0	41.1	103	5:09

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-29_Form2_FC0L_206S51_SJ2757428.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 12 Marine Corps Far Fish
#3
Sample Collection:
11-Apr-2020 09:30

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Project No. HDOH-HPU PFAS
Lab Sample I.D.: L33107-30

Matrix:	TISSUE	Sample Size:	2.03 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 09:31:42	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 52
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.788 (L)	
PPPeA	U		0.394 (L)	
PFHxA	U		0.197 (L)	
PFHpA	U		0.197 (L)	
PFOA	U		0.197 (L)	
PFNA	U		0.197 (L)	
PFDA	U		0.197 (L)	
PFUnA	U		0.197 (L)	
PFDoA	U		0.197 (L)	
PFTrDA	U		0.197 (L)	
PFTeDA	U		0.197 (L)	
PFBS	U		0.197 (L)	
PPPeS	U		0.197 (L)	
PFHxS	U		0.197 (L)	
PFHpS	U		0.197 (L)	
PFOS	U		0.197 (L)	
PFNS	U		0.197 (L)	
PFDS	U		0.197 (L)	
PFDoS	U H		0.197 (L)	
4:2 FTS	U		0.788 (L)	
6:2 FTS	U		0.709 (L)	
8:2 FTS	U		0.788 (L)	
PFOSA	U		0.197 (L)	
N-MeFOSA	U		0.227 (L)	
N-EtFOSA	U		0.493 (L)	
MeFOSAA	U		0.197 (L)	
EtFOSAA	U		0.197 (L)	
N-MeFOSE	U H		1.97 (L)	
N-EtFOSE	U		1.48 (L)	
HFPO-DA	U		0.749 (L)	
ADONA	U		0.788 (L)	
9CI-PF3ONS	U		0.788 (L)	
11CI-PF3OUdS	U		0.788 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonso _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 12 Marine Corps Far Fish #3
Sample Collection:
11-Apr-2020 09:30

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix: TISSUE

Sample Receipt Date: 20-May-2020

Extraction Date: 22-Jun-2020

Analysis Date: 25-Jun-2020 **Time:** 09:31:42

Extract Volume (uL): 4000

Injection Volume (uL): 2

Dilution Factor: N/A

Concentration Units: ng absolute

Project No.

HDOH-HPU PFAS

Lab Sample I.D.:

L33107-30

Sample Size:

2.03 g (wet)

Initial Calibration Date:

18-Mar-2020

Instrument ID:

LCMS/MS

Column ID:

C18

Sample Data Filename:

FC0L_206 S: 52

Blank Data Filename:

FC0L_206 S: 50

Cal. Ver. Data Filename:

FC0L_206 S: 45

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	34.8	86.9	1:49
13C5-PFPeA		20.0	21.4	107	4:24
13C5-PFHxA		10.0	9.78	97.8	5:01
13C4-PFHpA		10.0	8.99	89.9	5:28
13C8-PFOA		10.0	8.85	88.5	6:10
13C9-PFNA		5.00	4.30	86.0	7:01
13C6-PFDA		5.00	4.25	85.0	7:32
13C7-PFUnA		5.00	4.43	88.5	7:52
13C2-PFDaA		5.00	3.80	76.0	8:07
13C2-PFTeDA		5.00	3.29	65.9	8:48
13C3-PFBs		10.0	8.64	86.4	4:58
13C3-PFHxS		10.0	8.93	89.3	6:16
13C8-PFOS		10.0	10.0	100	7:38
13C2-4:2 FTS		20.0	25.7	128	4:53
13C2-6:2 FTS		20.0	16.2	80.9	5:52
13C2-8:2 FTS		20.0	22.3	111	7:22
13C8-PFOSA		10.0	10.9	109	8:43
D3-N-MeFOSA		10.0	6.53	65.3	10:09
D5-N-EtFOSA		10.0	7.27	72.7	10:26
D3-MeFOSAA		20.0	20.4	102	7:36
D5-EtFOSAA		20.0	23.4	117	7:44
d7-NMe-FOSE		100	7.38	7.38	10:01
d9-NEt-FOSE		100	99.1	99.1	10:19
13C3-HFPO-DA		40.0	40.1	100	5:09

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-30_Form2_FC0L_206S52_SJ2757429.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02
**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**
CLIENT SAMPLE NO.
Site 11 Landfill Fish #1
Sample Collection:
03-Mar-2020 16:25
SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-31		
Matrix:	TISSUE	Sample Size:	2.03 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 09:44:40	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 53
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.788 (L)	
PFPeA	U		0.394 (L)	
PFHxA	U		0.197 (L)	
PFHpA	U		0.197 (L)	
PFOA	U		0.197 (L)	
PFNA	U		0.197 (L)	
PFDA	U		0.197 (L)	
PFUnA	U		0.197 (L)	
PFDoA	U		0.197 (L)	
PFTrDA	U		0.197 (L)	
PFTeDA	U		0.197 (L)	
PFBS	U		0.197 (L)	
PFPeS	U		0.197 (L)	
PFHxS	U		0.197 (L)	
PFHpS	U		0.197 (L)	
PFOS	U		0.197 (L)	
PFNS	U		0.197 (L)	
PFDS	U		0.197 (L)	
PFDoS	U H		0.197 (L)	
4:2 FTS	U		0.788 (L)	
6:2 FTS	U		0.709 (L)	
8:2 FTS	U		0.788 (L)	
PFOSA	U		0.197 (L)	
N-MeFOSA	U		0.227 (L)	
N-EtFOSA	U		0.493 (L)	
MeFOSAA	U		0.197 (L)	
EtFOSAA	U		0.197 (L)	
N-MeFOSE	U H		1.97 (L)	
N-EtFOSE	U		1.48 (L)	
HFPO-DA	U		0.749 (L)	
ADONA	U		0.788 (L)	
9CI-PF3ONS	U		0.788 (L)	
11CI-PF3OUDS	U		0.788 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 11 Landfill Fish #1
Sample Collection:
03-Mar-2020 16:25

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-31
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 09:44:40	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 53
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	38.0	94.9	1:49
13C5-PFPeA	V	20.0	31.1	155	4:24
13C5-PFHxA		10.0	10.9	109	5:00
13C4-PFHxA		10.0	9.63	96.3	5:28
13C8-PFOA		10.0	9.54	95.4	6:10
13C9-PFNA		5.00	4.68	93.6	7:01
13C6-PFDA		5.00	4.79	95.8	7:32
13C7-PFUuA		5.00	4.72	94.4	7:52
13C2-PFDuA		5.00	4.90	98.0	8:07
13C2-PFTeDA		5.00	4.22	84.3	8:48
13C3-PFBS		10.0	9.68	96.8	4:58
13C3-PFHxA		10.0	9.74	97.4	6:16
13C8-PFOS		10.0	10.3	103	7:38
13C2-4:2 FTS		20.0	30.9	155	4:53
13C2-6:2 FTS		20.0	18.9	94.6	5:52
13C2-8:2 FTS		20.0	24.7	124	7:22
13C8-PFOSA		10.0	12.6	126	8:43
D3-N-MeFOSA		10.0	6.48	64.8	10:09
D5-N-EtFOSA		10.0	7.34	73.4	10:26
D3-MeFOSAA		20.0	24.3	122	7:36
D5-EtFOSAA		20.0	24.9	124	7:44
d7-NMe-FOSE		100	8.36	8.36	10:01
d9-NEt-FOSE		100	82.6	82.6	10:19
13C3-HFPO-DA		40.0	58.0	145	5:09

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-31_Form2_FC0L_206S53_SJ2757430.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02
**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**
**CLIENT SAMPLE NO.
Site 11 Landfill Fish #2
Sample Collection:
29-Apr-2020 13:00**
SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-32		
Matrix:	TISSUE	Sample Size:	2.07 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 09:57:37	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 54
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG¹	CONC. FOUND	REPORTING LIMIT (RL)²	RETENTION TIME
PFBA	U		0.773 (L)	
PFPeA	U		0.386 (L)	
PFHxA	U		0.193 (L)	
PFHpA	U		0.193 (L)	
PFOA	U		0.193 (L)	
PFNA	U		0.193 (L)	
PFDA	U		0.193 (L)	
PFUnA	J	0.197	0.193 (L)	7:52
PFDoA	U		0.193 (L)	
PFTrDA	U		0.193 (L)	
PFTeDA	U		0.193 (L)	
PFBS	U		0.193 (L)	
PFPeS	U		0.193 (L)	
PFHxS	U		0.193 (L)	
PFHpS	U		0.193 (L)	
PFOS	U		0.193 (L)	
PFNS	U		0.193 (L)	
PFDS	U		0.193 (L)	
PFDoS	U H		0.193 (L)	
4:2 FTS	U		0.773 (L)	
6:2 FTS	U		0.696 (L)	
8:2 FTS	U		0.773 (L)	
PFOSA	U		0.193 (L)	
N-MeFOSA	U		0.222 (L)	
N-EtFOSA	U		0.483 (L)	
MeFOSAA	U		0.193 (L)	
EtFOSAA	U		0.193 (L)	
N-MeFOSE	U H		1.93 (L)	
N-EtFOSE	U		1.45 (L)	
HFPO-DA	U		0.734 (L)	
ADONA	U		0.773 (L)	
9CI-PF3ONS	U		0.773 (L)	
11CI-PF3OUdS	U		0.773 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; J = concentration less than limit of quantification; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonso _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 11 Landfill Fish #2
Sample Collection:
29-Apr-2020 13:00

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-32
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 09:57:37	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 54
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng absolute		

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Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	38.5	96.3	1:49
13C5-PFPeA	V	20.0	40.2	201	4:24
13C5-PFHxA		10.0	10.7	107	5:01
13C4-PFHxA		10.0	10.0	100	5:28
13C8-PFOA		10.0	10.2	102	6:10
13C9-PFNA		5.00	4.69	93.7	7:01
13C6-PFDA		5.00	5.15	103	7:33
13C7-PFUuA		5.00	4.92	98.3	7:52
13C2-PFDuA		5.00	4.77	95.3	8:07
13C2-PFTeDA		5.00	4.14	82.7	8:49
13C3-PFBs		10.0	8.64	86.4	4:58
13C3-PFHxA		10.0	10.0	100	6:16
13C8-PFOS		10.0	11.1	111	7:38
13C2-4:2 FTS		20.0	32.6	163	4:53
13C2-6:2 FTS		20.0	23.7	118	5:53
13C2-8:2 FTS		20.0	29.9	149	7:22
13C8-PFOSA		10.0	12.7	127	8:43
D3-N-MeFOSA		10.0	7.51	75.1	10:09
D5-N-EtFOSA		10.0	7.13	71.3	10:27
D3-MeFOSAA		20.0	27.1	136	7:36
D5-EtFOSAA		20.0	32.7	164	7:44
d7-NMe-FOSE		100	7.69	7.69	10:01
d9-NEt-FOSE		100	110	110	10:19
13C3-HFPO-DA	V	40.0	70.4	176	5:09

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-32_Form2_FC0L_206S54_SJ2757431.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**

CLIENT SAMPLE NO.
Site 11 Landfill Fish #3
Sample Collection:
29-Apr-2020 12:10

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-33		
Matrix:	TISSUE	Sample Size:	2.04 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 10:10:42	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 55
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.784 (L)	
PFPeA	U		0.392 (L)	
PFHxA	U		0.196 (L)	
PFHpA	U		0.196 (L)	
PFOA	U		0.196 (L)	
PFNA	U		0.196 (L)	
PFDA	U		0.196 (L)	
PFUnA	U		0.196 (L)	
PFDoA	U		0.196 (L)	
PFTrDA	U		0.196 (L)	
PFTeDA	U		0.196 (L)	
PFBS	U		0.196 (L)	
PFPeS	U		0.196 (L)	
PFHxS	U		0.196 (L)	
PFHpS	U		0.196 (L)	
PFOS	U		0.196 (L)	
PFNS	U		0.196 (L)	
PFDS	U		0.196 (L)	
PFDoS	U H		0.196 (L)	
4:2 FTS	U		0.784 (L)	
6:2 FTS	U		0.706 (L)	
8:2 FTS	U		0.784 (L)	
PFOSA	U		0.196 (L)	
N-MeFOSA	U		0.225 (L)	
N-EtFOSA	U		0.490 (L)	
MeFOSAA	U		0.196 (L)	
EtFOSAA	U		0.196 (L)	
N-MeFOSE	U H		1.96 (L)	
N-EtFOSE	U		1.47 (L)	
HFPO-DA	U		0.745 (L)	
ADONA	U		0.784 (L)	
9CI-PF3ONS	U		0.784 (L)	
11CI-PF3OUDS	U		0.784 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 11 Landfill Fish #3
Sample Collection:
29-Apr-2020 12:10

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-33
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 10:10:42	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 55
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	38.9	97.2	1:49
13C5-PFPeA	V	20.0	36.6	183	4:24
13C5-PFHxA		10.0	10.6	106	5:01
13C4-PFHxA		10.0	10.4	104	5:28
13C8-PFOA		10.0	9.72	97.2	6:10
13C9-PFNA		5.00	4.86	97.1	7:01
13C6-PFDA		5.00	5.16	103	7:32
13C7-PFUuA		5.00	4.57	91.3	7:52
13C2-PFDuA		5.00	4.25	85.1	8:07
13C2-PFTeDA		5.00	2.95	59.0	8:49
13C3-PFBS		10.0	9.26	92.6	4:58
13C3-PFHxA		10.0	10.1	101	6:16
13C8-PFOS		10.0	11.2	112	7:37
13C2-4:2 FTS		20.0	29.6	148	4:53
13C2-6:2 FTS		20.0	19.8	99.2	5:53
13C2-8:2 FTS		20.0	25.2	126	7:22
13C8-PFOSA		10.0	12.3	123	8:43
D3-N-MeFOSA		10.0	5.41	54.1	10:09
D5-N-EtFOSA		10.0	7.54	75.4	10:27
D3-MeFOSAA		20.0	25.7	128	7:35
D5-EtFOSAA		20.0	29.4	147	7:44
d7-NMe-FOSE		100	62.4	62.4	10:01
d9-NEt-FOSE		100	86.4	86.4	10:19
13C3-HFPO-DA	V	40.0	68.9	172	5:09

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-33_Form2_FC0L_206S55_SJ2757432.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02
**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**
CLIENT SAMPLE NO.
Site 13 K North Fish #1
Sample Collection:
07-May-2020 10:40
SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-34		
Matrix:	TISSUE	Sample Size:	2.04 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 10:23:39	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 56
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.784 (L)	
PFPeA	U		0.392 (L)	
PFHxA	U		0.196 (L)	
PFHpA	U		0.196 (L)	
PFOA	U		0.196 (L)	
PFNA	U		0.196 (L)	
PFDA	U		0.196 (L)	
PFUnA	U		0.196 (L)	
PFDoA	U		0.196 (L)	
PFTrDA	U		0.196 (L)	
PFTeDA	U		0.196 (L)	
PFBS	U		0.196 (L)	
PFPeS	U		0.196 (L)	
PFHxS	U		0.196 (L)	
PFHpS	U		0.196 (L)	
PFOS	U		0.196 (L)	
PFNS	U		0.196 (L)	
PFDS	U		0.196 (L)	
PFDoS	U H		0.196 (L)	
4:2 FTS	U		0.784 (L)	
6:2 FTS	U		0.706 (L)	
8:2 FTS	U		0.784 (L)	
PFOSA	U		0.196 (L)	
N-MeFOSA	U		0.225 (L)	
N-EtFOSA	U		0.490 (L)	
MeFOSAA	U		0.196 (L)	
EtFOSAA	U		0.196 (L)	
N-MeFOSE	U H		1.96 (L)	
N-EtFOSE	U		1.47 (L)	
HFPO-DA	U		0.745 (L)	
ADONA	U		0.784 (L)	
9CI-PF3ONS	U		0.784 (L)	
11CI-PF3OUDS	U		0.784 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 13 K North Fish #1
Sample Collection:
07-May-2020 10:40

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-34
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 10:23:39	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 56
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	39.7	99.2	1:49
13C5-PFPeA	V	20.0	30.3	151	4:24
13C5-PFHxA		10.0	10.7	107	5:01
13C4-PFHxA		10.0	9.69	96.9	5:28
13C8-PFOA		10.0	9.79	97.9	6:10
13C9-PFNA		5.00	5.00	99.9	7:01
13C6-PFDA		5.00	5.44	109	7:32
13C7-PFUuA		5.00	4.98	99.6	7:52
13C2-PFDuA		5.00	5.24	105	8:07
13C2-PFTeDA		5.00	3.97	79.3	8:49
13C3-PFBS		10.0	8.96	89.6	4:58
13C3-PFHxA		10.0	10.5	105	6:16
13C8-PFOS		10.0	11.1	111	7:37
13C2-4:2 FTS		20.0	29.1	146	4:53
13C2-6:2 FTS		20.0	18.9	94.6	5:53
13C2-8:2 FTS		20.0	24.5	122	7:22
13C8-PFOSA		10.0	13.0	130	8:43
D3-N-MeFOSA		10.0	7.55	75.5	10:09
D5-N-EtFOSA		10.0	7.97	79.7	10:26
D3-MeFOSAA		20.0	25.0	125	7:35
D5-EtFOSAA		20.0	27.4	137	7:44
d7-NMe-FOSE		100	8.14	8.14	10:01
d9-NEt-FOSE		100	120	120	10:19
13C3-HFPO-DA		40.0	55.8	140	5:09

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-34_Form2_FC0L_206S56_SJ2757433.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**

CLIENT SAMPLE NO.
Site 13 K North Fish #2
Sample Collection:
07-May-2020 10:50

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-35		
Matrix:	TISSUE	Sample Size:	2.03 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 10:36:44	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 57
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.788 (L)	
PFPeA	U		0.394 (L)	
PFHxA	U		0.197 (L)	
PFHpA	U		0.197 (L)	
PFOA	U		0.197 (L)	
PFNA	U		0.197 (L)	
PFDA	U		0.197 (L)	
PFUnA	U		0.197 (L)	
PFDoA	U		0.197 (L)	
PFTrDA	U		0.197 (L)	
PFTeDA	U		0.197 (L)	
PFBS	U		0.197 (L)	
PFPeS	U		0.197 (L)	
PFHxS	U		0.197 (L)	
PFHpS	U		0.197 (L)	
PFOS		0.766	0.197 (L)	
PFNS	U		0.197 (L)	
PFDS	U		0.197 (L)	
PFDoS	U H		0.197 (L)	
4:2 FTS	U		0.788 (L)	
6:2 FTS	U		0.709 (L)	
8:2 FTS	U		0.788 (L)	
PFOSA	U		0.197 (L)	
N-MeFOSA	U		0.227 (L)	
N-EtFOSA	U		0.493 (L)	
MeFOSAA	U		0.197 (L)	
EtFOSAA	U		0.197 (L)	
N-MeFOSE	U H		1.97 (L)	
N-EtFOSE	U		1.48 (L)	
HFPO-DA	U		0.749 (L)	
ADONA	U		0.788 (L)	
9CI-PF3ONS	U		0.788 (L)	
11CI-PF3OUDS	U		0.788 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 13 K North Fish #2
Sample Collection:
07-May-2020 10:50

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-35
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 10:36:44	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 57
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	38.7	96.8	1:49
13C5-PFPeA		20.0	28.6	143	4:24
13C5-PFHxA		10.0	10.4	104	5:01
13C4-PFHxA		10.0	10.4	104	5:28
13C8-PFOA		10.0	9.79	97.9	6:11
13C9-PFNA		5.00	4.66	93.3	7:02
13C6-PFDA		5.00	5.26	105	7:33
13C7-PFUuA		5.00	5.13	103	7:52
13C2-PFDuA		5.00	4.50	90.0	8:07
13C2-PFTeDA		5.00	3.79	75.8	8:49
13C3-PFBs		10.0	9.16	91.6	4:58
13C3-PFHxA		10.0	9.96	99.6	6:16
13C8-PFOS		10.0	11.4	114	7:38
13C2-4:2 FTS		20.0	28.5	143	4:53
13C2-6:2 FTS		20.0	18.6	93.2	5:53
13C2-8:2 FTS		20.0	23.8	119	7:22
13C8-PFOSA		10.0	12.8	128	8:44
D3-N-MeFOSA		10.0	7.20	72.0	10:09
D5-N-EtFOSA		10.0	7.57	75.7	10:27
D3-MeFOSAA		20.0	24.9	125	7:36
D5-EtFOSAA		20.0	28.4	142	7:44
d7-NMe-FOSE		100	7.89	7.89	10:01
d9-NEt-FOSE		100	104	104	10:19
13C3-HFPO-DA		40.0	55.2	138	5:09

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

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Report Filename: PFC_FC_LC_PFAS_L33107-35_Form2_FC0L_206S57_SJ2757434.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**

CLIENT SAMPLE NO.
Site 13 K North Fish #3
Sample Collection:
07-May-2020 10:40

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-36		
Matrix:	TISSUE	Sample Size:	2.06 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 10:49:42	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 58
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.777 (L)	
PFPeA	U		0.388 (L)	
PFHxA	U		0.194 (L)	
PFHpA	U		0.194 (L)	
PFOA	U		0.194 (L)	
PFNA	U		0.194 (L)	
PFDA	U		0.194 (L)	
PFUnA	U		0.194 (L)	
PFDoA	U		0.194 (L)	
PFTrDA	U		0.194 (L)	
PFTeDA	U		0.194 (L)	
PFBS	U		0.194 (L)	
PFPeS	U		0.194 (L)	
PFHxS	U		0.194 (L)	
PFHpS	U		0.194 (L)	
PFOS	U		0.194 (L)	
PFNS	U		0.194 (L)	
PFDS	U		0.194 (L)	
PFDoS	U H		0.194 (L)	
4:2 FTS	U		0.777 (L)	
6:2 FTS	U		0.699 (L)	
8:2 FTS	U		0.777 (L)	
PFOSA	U		0.194 (L)	
N-MeFOSA	U		0.223 (L)	
N-EtFOSA	U		0.485 (L)	
MeFOSAA	U		0.194 (L)	
EtFOSAA	U		0.194 (L)	
N-MeFOSE	U H		1.94 (L)	
N-EtFOSE	U		1.46 (L)	
HFPO-DA	U		0.738 (L)	
ADONA	U		0.777 (L)	
9CI-PF3ONS	U		0.777 (L)	
11CI-PF3OUDS	U		0.777 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 13 K North Fish #3
Sample Collection:
07-May-2020 10:40

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-36
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 10:49:42	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 58
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	37.9	94.8	1:49
13C5-PFPeA	V	20.0	34.0	170	4:24
13C5-PFHxA		10.0	10.5	105	5:01
13C4-PFHxA		10.0	9.93	99.3	5:28
13C8-PFOA		10.0	10.1	101	6:10
13C9-PFNA		5.00	4.80	95.9	7:01
13C6-PFDA		5.00	5.13	103	7:32
13C7-PFUuA		5.00	5.13	103	7:52
13C2-PFDuA		5.00	5.05	101	8:07
13C2-PFTeDA		5.00	4.13	82.7	8:48
13C3-PFBS		10.0	9.58	95.8	4:58
13C3-PFHxA		10.0	10.2	102	6:16
13C8-PFOS		10.0	10.8	108	7:37
13C2-4:2 FTS		20.0	30.8	154	4:53
13C2-6:2 FTS		20.0	19.0	94.8	5:53
13C2-8:2 FTS		20.0	23.7	119	7:22
13C8-PFOSA		10.0	13.8	138	8:43
D3-N-MeFOSA		10.0	6.20	62.0	10:09
D5-N-EtFOSA		10.0	7.21	72.1	10:26
D3-MeFOSAA		20.0	25.2	126	7:35
D5-EtFOSAA		20.0	25.9	129	7:44
d7-NMe-FOSE		100	13.2	13.2	10:01
d9-NEt-FOSE		100	95.1	95.1	10:19
13C3-HFPO-DA	V	40.0	62.9	157	5:09

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-36_Form2_FC0L_206S58_SJ2757435.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**

CLIENT SAMPLE NO.
Site 14 Kahuku Fish #1
Sample Collection:
13-May-2020 11:07

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS
Lab Sample I.D.:	L33107-37
Matrix:	TISSUE
Sample Size:	2.03 g (wet)
Sample Receipt Date:	20-May-2020
Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020
Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 11:02:47
Column ID:	C18
Extract Volume (uL):	4000
Sample Data Filename:	FC0L_206 S: 59
Injection Volume (uL):	2
Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A
Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng/g (wet weight basis)

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.788 (L)	
PFPeA	U		0.394 (L)	
PFHxA	U		0.197 (L)	
PFHpA	U		0.197 (L)	
PFOA	U		0.197 (L)	
PFNA	U		0.197 (L)	
PFDA	U		0.197 (L)	
PFUnA	U		0.197 (L)	
PFDoA	U		0.197 (L)	
PFTrDA	U		0.197 (L)	
PFTeDA	U		0.197 (L)	
PFBS	U		0.197 (L)	
PFPeS	U		0.197 (L)	
PFHxS	U		0.197 (L)	
PFHpS	U		0.197 (L)	
PFOS	U		0.197 (L)	
PFNS	U		0.197 (L)	
PFDS	U		0.197 (L)	
PFDoS	U H		0.197 (L)	
4:2 FTS	U		0.788 (L)	
6:2 FTS	U		0.709 (L)	
8:2 FTS	U		0.788 (L)	
PFOSA	U		0.197 (L)	
N-MeFOSA	U		0.227 (L)	
N-EtFOSA	U		0.493 (L)	
MeFOSAA	U		0.197 (L)	
EtFOSAA	U		0.197 (L)	
N-MeFOSE	U H		1.97 (L)	
N-EtFOSE	U		1.48 (L)	
HFPO-DA	U		0.749 (L)	
ADONA	U		0.788 (L)	
9CI-PF3ONS	U		0.788 (L)	
11CI-PF3OUDS	U		0.788 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 14 Kahuku Fish #1
Sample Collection:
13-May-2020 11:07

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-37
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 11:02:47	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 59
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	31.1	77.7	1:49
13C5-PFPeA		20.0	27.5	138	4:24
13C5-PFHxA		10.0	8.84	88.4	5:01
13C4-PFHxA		10.0	7.48	74.8	5:28
13C8-PFOA		10.0	7.68	76.8	6:10
13C9-PFNA		5.00	3.83	76.5	7:01
13C6-PFDA		5.00	3.96	79.2	7:32
13C7-PFUuA		5.00	4.25	85.0	7:52
13C2-PFDuA		5.00	4.15	83.0	8:07
13C2-PFTeDA		5.00	3.44	68.9	8:49
13C3-PFBS		10.0	7.35	73.5	4:58
13C3-PFHxA		10.0	8.13	81.3	6:16
13C8-PFOS		10.0	8.72	87.2	7:38
13C2-4:2 FTS		20.0	23.6	118	4:53
13C2-6:2 FTS		20.0	15.3	76.5	5:53
13C2-8:2 FTS		20.0	20.8	104	7:22
13C8-PFOSA		10.0	11.0	110	8:43
D3-N-MeFOSA		10.0	6.13	61.3	10:09
D5-N-EtFOSA		10.0	5.23	52.3	10:27
D3-MeFOSAA		20.0	20.0	100	7:35
D5-EtFOSAA		20.0	23.4	117	7:44
d7-NMe-FOSE		100	6.56	6.56	10:01
d9-NEt-FOSE		100	84.6	84.6	10:19
13C3-HFPO-DA		40.0	53.3	133	5:09

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-37_Form2_FC0L_206S59_SJ2757436.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**

CLIENT SAMPLE NO.
Site 14 Kahuku Fish #2
Sample Collection:
13-May-2020 12:15

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS		
Lab Sample I.D.:	L33107-38		
Matrix:	TISSUE	Sample Size:	2.09 g (wet)
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 11:15:44	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 60
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.766 (L)	
PFPeA	U		0.383 (L)	
PFHxA	U		0.191 (L)	
PFHpA	U		0.191 (L)	
PFOA	U		0.191 (L)	
PFNA	U		0.191 (L)	
PFDA	U		0.191 (L)	
PFUnA	U		0.191 (L)	
PFDoA	U		0.191 (L)	
PFTrDA	U		0.191 (L)	
PFTeDA	U		0.191 (L)	
PFBS	U		0.191 (L)	
PFPeS	U		0.191 (L)	
PFHxS	U		0.191 (L)	
PFHpS	U		0.191 (L)	
PFOS	U		0.191 (L)	
PFNS	U		0.191 (L)	
PFDS	U		0.191 (L)	
PFDoS	U H		0.191 (L)	
4:2 FTS	U		0.766 (L)	
6:2 FTS	U		0.689 (L)	
8:2 FTS	U		0.766 (L)	
PFOSA	U		0.191 (L)	
N-MeFOSA	U		0.220 (L)	
N-EtFOSA	U		0.478 (L)	
MeFOSAA	U		0.191 (L)	
EtFOSAA	U		0.191 (L)	
N-MeFOSE	U H		1.91 (L)	
N-EtFOSE	U		1.44 (L)	
HFPO-DA	U		0.727 (L)	
ADONA	U		0.766 (L)	
9CI-PF3ONS	U		0.766 (L)	
11CI-PF3OUDS	U		0.766 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 14 Kahuku Fish #2
Sample Collection:
13-May-2020 12:15

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-38
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 11:15:44	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 60
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	35.1	87.9	1:49
13C5-PFPeA		20.0	24.7	123	4:24
13C5-PFHxA		10.0	9.61	96.1	5:01
13C4-PFHxA		10.0	9.28	92.8	5:28
13C8-PFOA		10.0	8.79	87.9	6:10
13C9-PFNA		5.00	4.18	83.7	7:01
13C6-PFDA		5.00	4.67	93.3	7:32
13C7-PFUuA		5.00	4.37	87.4	7:52
13C2-PFDuA		5.00	4.32	86.4	8:07
13C2-PFTeDA		5.00	3.04	60.7	8:49
13C3-PFBS		10.0	8.02	80.2	4:58
13C3-PFHxA		10.0	8.92	89.2	6:16
13C8-PFOS		10.0	9.86	98.6	7:38
13C2-4:2 FTS		20.0	25.7	129	4:53
13C2-6:2 FTS		20.0	16.8	83.9	5:53
13C2-8:2 FTS		20.0	22.7	113	7:22
13C8-PFOSA		10.0	11.2	112	8:43
D3-N-MeFOSA		10.0	5.82	58.2	10:09
D5-N-EtFOSA		10.0	6.75	67.5	10:27
D3-MeFOSAA		20.0	23.2	116	7:36
D5-EtFOSAA		20.0	24.1	120	7:44
d7-NMe-FOSE		100	7.83	7.83	10:01
d9-NEt-FOSE		100	85.9	85.9	10:19
13C3-HFPO-DA		40.0	43.4	109	5:09

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-38_Form2_FC0L_206S60_SJ2757437.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 14 Kahuku Fish #3
Sample Collection:
13-May-2020 10:45

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix: TISSUE

Project No.

HDOH-HPU PFAS

Sample Receipt Date: 20-May-2020

Lab Sample I.D.:

L33107-39

Extraction Date: 22-Jun-2020

Initial Calibration Date:

18-Mar-2020

Analysis Date: 25-Jun-2020 **Time:** 11:28:49

Instrument ID:

LCMS/MS

Extract Volume (uL): 4000

Column ID:

C18

Injection Volume (uL): 2

Sample Data Filename:

FC0L_206 S: 61

Dilution Factor: N/A

Blank Data Filename:

FC0L_206 S: 50

Concentration Units: ng/g (wet weight basis)

Cal. Ver. Data Filename:

FC0L_206 S: 45

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.800 (L)	
PFPeA	U		0.400 (L)	
PFHxA	U		0.200 (L)	
PFHpA	U		0.200 (L)	
PFOA	U		0.200 (L)	
PFNA	U		0.200 (L)	
PFDA	U		0.200 (L)	
PFUnA	J	0.213	0.200 (L)	7:52
PFDoA	U		0.200 (L)	
PFTrDA	U		0.200 (L)	
PFTeDA	U		0.200 (L)	
PFBS	U		0.200 (L)	
PFPeS	U		0.200 (L)	
PFHxS	U		0.200 (L)	
PFHpS	U		0.200 (L)	
PFOS	U		0.200 (L)	
PFNS	U		0.200 (L)	
PFDS	U		0.200 (L)	
PFDoS	U H		0.200 (L)	
4:2 FTS	U		0.800 (L)	
6:2 FTS	U		0.720 (L)	
8:2 FTS	U		0.800 (L)	
PFOSA	U		0.200 (L)	
N-MeFOSA	U		0.230 (L)	
N-EtFOSA	U		0.500 (L)	
MeFOSAA	U		0.200 (L)	
EtFOSAA	U		0.200 (L)	
N-MeFOSE	U H		2.00 (L)	
N-EtFOSE	U		1.50 (L)	
HFPO-DA	U		0.760 (L)	
ADONA	U		0.800 (L)	
9CI-PF3ONS	U		0.800 (L)	
11CI-PF3OUdS	U		0.800 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; J = concentration less than limit of quantification; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonso _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 14 Kahuku Fish #3
Sample Collection:
13-May-2020 10:45

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-39
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 11:28:49	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 61
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	34.6	86.6	1:50
13C5-PFPeA	V	20.0	42.1	211	4:24
13C5-PFHxA		10.0	9.11	91.1	5:01
13C4-PFHxA		10.0	9.03	90.3	5:28
13C8-PFOA		10.0	8.61	86.1	6:11
13C9-PFNA		5.00	4.25	85.0	7:02
13C6-PFDA		5.00	4.88	97.6	7:33
13C7-PFUuA		5.00	4.89	97.9	7:52
13C2-PFDuA		5.00	4.75	95.1	8:07
13C2-PFTeDA		5.00	3.53	70.6	8:49
13C3-PFBS		10.0	6.38	63.8	4:58
13C3-PFHxA		10.0	8.98	89.8	6:16
13C8-PFOS		10.0	9.75	97.5	7:38
13C2-4:2 FTS		20.0	26.6	133	4:53
13C2-6:2 FTS		20.0	20.5	102	5:53
13C2-8:2 FTS		20.0	28.3	142	7:22
13C8-PFOSA		10.0	11.5	115	8:44
D3-N-MeFOSA		10.0	6.06	60.6	10:09
D5-N-EtFOSA		10.0	6.93	69.3	10:27
D3-MeFOSAA		20.0	25.8	129	7:36
D5-EtFOSAA		20.0	29.6	148	7:44
d7-NMe-FOSE		100	6.59	6.59	10:01
d9-NEt-FOSE		100	87.8	87.8	10:19
13C3-HFPO-DA	V	40.0	70.0	175	5:09

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-39_Form2_FC0L_206S61_SJ2757438.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**

CLIENT SAMPLE NO.
Site 15 Haleiwa Fish #1
Sample Collection:
07-May-2020 13:50

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 4066

Project No.	HDOH-HPU PFAS
Lab Sample I.D.:	L33107-40
Matrix:	TISSUE
Sample Size:	2.11 g (wet)
Sample Receipt Date:	20-May-2020
Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020
Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 11:41:47
Column ID:	C18
Extract Volume (uL):	4000
Sample Data Filename:	FC0L_206 S: 62
Injection Volume (uL):	2
Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A
Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng/g (wet weight basis)

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.758 (L)	
PFPeA	U		0.379 (L)	
PFHxA	U		0.190 (L)	
PFHpA	U		0.190 (L)	
PFOA	U		0.190 (L)	
PFNA	U		0.190 (L)	
PFDA	U		0.190 (L)	
PFUnA	U		0.190 (L)	
PFDoA	U		0.190 (L)	
PFTrDA	U		0.190 (L)	
PFTeDA	U		0.190 (L)	
PFBS	U		0.190 (L)	
PFPeS	U		0.190 (L)	
PFHxS	U		0.190 (L)	
PFHpS	U		0.190 (L)	
PFOS	U		0.190 (L)	
PFNS	U		0.190 (L)	
PFDS	U		0.190 (L)	
PFDoS	U H		0.190 (L)	
4:2 FTS	U		0.758 (L)	
6:2 FTS	U		0.682 (L)	
8:2 FTS	U		0.758 (L)	
PFOSA	U		0.190 (L)	
N-MeFOSA	U		0.218 (L)	
N-EtFOSA	U		0.474 (L)	
MeFOSAA	U		0.190 (L)	
EtFOSAA	U		0.190 (L)	
N-MeFOSE	U H		1.90 (L)	
N-EtFOSE	U		1.42 (L)	
HFPO-DA	U		0.720 (L)	
ADONA	U		0.758 (L)	
9CI-PF3ONS	U		0.758 (L)	
11CI-PF3OUDS	U		0.758 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 15 Haleiwa Fish #1
Sample Collection:
07-May-2020 13:50

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-40
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 11:41:47	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 62
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng absolute		

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Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	34.1	85.2	1:49
13C5-PFPeA	V	20.0	37.7	189	4:24
13C5-PFHxA		10.0	9.13	91.3	5:00
13C4-PFHxA		10.0	8.93	89.3	5:28
13C8-PFOA		10.0	8.70	87.0	6:10
13C9-PFNA		5.00	4.13	82.6	7:01
13C6-PFDA		5.00	4.87	97.5	7:32
13C7-PFUuA		5.00	4.96	99.3	7:52
13C2-PFDuA		5.00	4.58	91.7	8:07
13C2-PFTeDA		5.00	3.84	76.9	8:49
13C3-PFBS		10.0	6.26	62.6	4:58
13C3-PFHxA		10.0	8.85	88.5	6:16
13C8-PFOS		10.0	9.74	97.4	7:37
13C2-4:2 FTS		20.0	24.5	122	4:53
13C2-6:2 FTS		20.0	17.8	89.0	5:53
13C2-8:2 FTS		20.0	21.7	108	7:22
13C8-PFOSA		10.0	11.8	118	8:43
D3-N-MeFOSA		10.0	7.31	73.1	10:09
D5-N-EtFOSA		10.0	4.90	49.0	10:26
D3-MeFOSAA		20.0	23.4	117	7:35
D5-EtFOSAA		20.0	25.5	127	7:44
d7-NMe-FOSE		100	7.41	7.41	10:01
d9-NEt-FOSE		100	80.9	80.9	10:19
13C3-HFPO-DA		40.0	59.4	148	5:09

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-40_Form2_FC0L_206S62_SJ2757439.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 15 Haleiwa Fish #2
Sample Collection:
07-May-2020 13:55

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 11:54:51	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FCOL_206 S: 63
Injection Volume (uL):	2	Blank Data Filename:	FCOL_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FCOL_206 S: 45
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.766 (L)	
PPPeA	U		0.383 (L)	
PFHxA	U		0.191 (L)	
PFHpA	U		0.191 (L)	
PFOA	U		0.191 (L)	
PFNA	U		0.191 (L)	
PFDA	U		0.191 (L)	
PFUnA	J	0.192	0.191 (L)	7:52
PFDoA	U		0.191 (L)	
PFTrDA	U		0.191 (L)	
PFTeDA	U		0.191 (L)	
PFBS	U		0.191 (L)	
PPPeS	U		0.191 (L)	
PFHxS	U		0.191 (L)	
PFHpS	U		0.191 (L)	
PFOS	U		0.191 (L)	
PFNS	U		0.191 (L)	
PFDS	U		0.191 (L)	
PFDoS	U H		0.191 (L)	
4:2 FTS	U		0.766 (L)	
6:2 FTS	B J	0.723	0.689 (L)	5:53
8:2 FTS	U		0.766 (L)	
PFOSA	U		0.191 (L)	
N-MeFOSA	U		0.220 (L)	
N-EtFOSA	U		0.478 (L)	
MeFOSAA	U		0.191 (L)	
EtFOSAA	U		0.191 (L)	
N-MeFOSE	U H		1.91 (L)	
N-EtFOSE	U		1.44 (L)	
HFPO-DA	U		0.727 (L)	
ADONA	U		0.766 (L)	
9CI-PF3ONS	U		0.766 (L)	
11CI-PF3OuDs	U		0.766 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; B = analyte found in the associated blank and concentration in sample is less than 10X the concentration in the associated blank; J = concentration less than limit of quantification; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 15 Haleiwa Fish #2
Sample Collection:
07-May-2020 13:55

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-41
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 11:54:51	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 63
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	35.9	89.6	1:49
13C5-PFPeA	V	20.0	51.9	260	4:24
13C5-PFHxA		10.0	9.80	98.0	5:00
13C4-PFHxA		10.0	9.54	95.4	5:28
13C8-PFOA		10.0	9.58	95.8	6:10
13C9-PFNA		5.00	4.32	86.3	7:01
13C6-PFDA		5.00	4.79	95.9	7:32
13C7-PFUuA		5.00	4.76	95.2	7:52
13C2-PFDuA		5.00	4.55	90.9	8:07
13C2-PFTeDA		5.00	3.60	72.0	8:49
13C3-PFBS		10.0	6.59	65.9	4:58
13C3-PFHxA		10.0	9.30	93.0	6:16
13C8-PFOS		10.0	10.5	105	7:38
13C2-4:2 FTS		20.0	25.8	129	4:53
13C2-6:2 FTS		20.0	19.6	98.0	5:53
13C2-8:2 FTS		20.0	23.7	119	7:22
13C8-PFOSA		10.0	12.2	122	8:44
D3-N-MeFOSA		10.0	7.09	70.9	10:09
D5-N-EtFOSA		10.0	7.61	76.1	10:26
D3-MeFOSAA		20.0	24.9	124	7:35
D5-EtFOSAA		20.0	27.3	137	7:43
d7-NMe-FOSE		100	7.49	7.49	10:01
d9-NEt-FOSE		100	99.1	99.1	10:19
13C3-HFPO-DA	V	40.0	95.1	238	5:09

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-41_Form2_FC0L_206S63_SJ2757440.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 15 Haleiwa Fish #3
Sample Collection:
07-May-2020 14:00

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.:	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 12:07:49	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 64
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng/g (wet weight basis)		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.800 (L)	
PFPeA	U		0.400 (L)	
PFHxA	U		0.200 (L)	
PFHpA	U		0.200 (L)	
PFOA	U		0.200 (L)	
PFNA	U		0.200 (L)	
PFDA	U		0.200 (L)	
PFUnA	J	0.246	0.200 (L)	7:52
PFDoA	U		0.200 (L)	
PFTrDA	U		0.200 (L)	
PFTeDA	U		0.200 (L)	
PFBS	U		0.200 (L)	
PFPeS	U		0.200 (L)	
PFHxS	U		0.200 (L)	
PFHpS	U		0.200 (L)	
PFOS	U		0.200 (L)	
PFNS	U		0.200 (L)	
PFDS	U		0.200 (L)	
PFDoS	U H		0.200 (L)	
4:2 FTS	U		0.800 (L)	
6:2 FTS	U		0.720 (L)	
8:2 FTS	U		0.800 (L)	
PFOSA	U		0.200 (L)	
N-MeFOSA	U		0.230 (L)	
N-EtFOSA	U		0.500 (L)	
MeFOSAA	U		0.200 (L)	
EtFOSAA	U		0.200 (L)	
N-MeFOSE	U H		2.00 (L)	
N-EtFOSE	U		1.50 (L)	
HFPO-DA	U		0.760 (L)	
ADONA	U		0.800 (L)	
9CI-PF3ONS	U		0.800 (L)	
11CI-PF3OUdS	U		0.800 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; J = concentration less than limit of quantification; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonso _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Site 15 Haleiwa Fish #3
Sample Collection:
07-May-2020 14:00

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	HDOH-HPU PFAS
Sample Receipt Date:	20-May-2020	Lab Sample I.D.:	L33107-42
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 12:07:49	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 64
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	35.8	89.6	1:49
13C5-PFPeA	V	20.0	46.1	230	4:24
13C5-PFHxA		10.0	9.69	96.9	5:00
13C4-PFHxA		10.0	9.43	94.3	5:28
13C8-PFOA		10.0	9.15	91.5	6:10
13C9-PFNA		5.00	4.47	89.5	7:01
13C6-PFDA		5.00	5.23	105	7:32
13C7-PFUuA		5.00	5.12	102	7:52
13C2-PFDuA		5.00	4.75	94.9	8:07
13C2-PFTeDA		5.00	3.88	77.7	8:48
13C3-PFBs		10.0	6.91	69.1	4:58
13C3-PFHxA		10.0	9.00	90.0	6:16
13C8-PFOS		10.0	10.1	101	7:37
13C2-4:2 FTS		20.0	26.1	130	4:53
13C2-6:2 FTS		20.0	18.6	93.1	5:53
13C2-8:2 FTS		20.0	23.7	118	7:22
13C8-PFOSA		10.0	12.8	128	8:43
D3-N-MeFOSA		10.0	7.35	73.5	10:09
D5-N-EtFOSA		10.0	7.15	71.5	10:26
D3-MeFOSAA		20.0	24.4	122	7:35
D5-EtFOSAA		20.0	27.8	139	7:44
d7-NMe-FOSE		100	7.62	7.62	10:01
d9-NEt-FOSE		100	89.4	89.4	10:19
13C3-HFPO-DA	V	40.0	81.5	204	5:09

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33107-42_Form2_FC0L_206S64_SJ2757441.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.

Lab Blank
Sample Collection:
N/A

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Project No.

N/A

Lab Sample I.D.:

WG72538-101

Matrix: TISSUE

Sample Size:

2.00 g

Sample Receipt Date: N/A

Initial Calibration Date:

18-Mar-2020

Extraction Date: 22-Jun-2020

Instrument ID:

LCMS/MS

Analysis Date: 25-Jun-2020 **Time:** 09:05:40

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC0L_206 S: 50

Injection Volume (uL): 2

Blank Data Filename:

FC0L_206 S: 50

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC0L_206 S: 45

Concentration Units: ng/g

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.800 (L)	
PFPeA	U		0.400 (L)	
PFHxA	U		0.200 (L)	
PFHpA	U		0.200 (L)	
PFOA	U		0.200 (L)	
PFNA	U		0.200 (L)	
PFDA	U		0.200 (L)	
PFUnA	U		0.200 (L)	
PFDoA	U		0.200 (L)	
PFTrDA	U		0.200 (L)	
PFTeDA	U		0.200 (L)	
PFBS	U		0.200 (L)	
PFPeS	U		0.200 (L)	
PFHxS	U		0.200 (L)	
PFHpS	U		0.200 (L)	
PFOS	U		0.200 (L)	
PFNS	U		0.200 (L)	
PFDS	U		0.200 (L)	
PFDoS	U H		0.200 (L)	
4:2 FTS	U		0.800 (L)	
6:2 FTS	J	0.898	0.720 (L)	5:52
8:2 FTS	U		0.800 (L)	
PFOSA	U		0.200 (L)	
N-MeFOSA	U		0.230 (L)	
N-EtFOSA	U		0.500 (L)	
MeFOSAA	U		0.200 (L)	
EtFOSAA	U		0.200 (L)	
N-MeFOSE	U H		2.00 (L)	
N-EtFOSE	U		1.50 (L)	
HFPO-DA	U		0.760 (L)	
ADONA	U		0.800 (L)	
9CI-PF3ONS	U		0.800 (L)	
11CI-PF3OUdS	U		0.800 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; J = concentration less than limit of quantification; H = concentration is estimated.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonso _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Lab Blank
Sample Collection:
N/A

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix:	TISSUE	Project No.	N/A
Sample Receipt Date:	N/A	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 09:05:40	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC0L_206 S: 50
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	34.7	86.6	1:49
13C5-PFPeA		20.0	19.6	98.2	4:24
13C5-PFHxA		10.0	9.92	99.2	5:00
13C4-PFHxA		10.0	9.49	94.9	5:27
13C8-PFOA		10.0	9.02	90.2	6:09
13C9-PFNA		5.00	4.54	90.9	7:01
13C6-PFDA		5.00	4.58	91.6	7:32
13C7-PFUuA		5.00	4.45	88.9	7:51
13C2-PFDuA		5.00	4.34	86.8	8:06
13C2-PFTeDA		5.00	4.13	82.6	8:48
13C3-PFBS		10.0	9.06	90.6	4:57
13C3-PFHxA		10.0	8.69	86.9	6:15
13C8-PFOS		10.0	10.2	102	7:37
13C2-4:2 FTS		20.0	30.6	153	4:53
13C2-6:2 FTS		20.0	20.1	100	5:52
13C2-8:2 FTS		20.0	27.7	139	7:22
13C8-PFOSA		10.0	12.6	126	8:43
D3-N-MeFOSA		10.0	6.63	66.3	10:08
D5-N-EtFOSA		10.0	6.27	62.7	10:26
D3-MeFOSAA		20.0	28.3	141	7:35
D5-EtFOSAA		20.0	34.1	170	7:43
d7-NMe-FOSE		100	6.20	6.20	10:00
d9-NEt-FOSE		100	57.5	57.5	10:18
13C3-HFPO-DA		40.0	38.3	95.8	5:09

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_WG72538-101_Form2_FC0L_206S50_SJ2757426.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 8A
PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4066	Lab Sample I.D.:	WG72538-102
Matrix:	TISSUE	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 08:39:38	Column ID:	C18
Extract Volume (uL):	4000	OPR Data Filename:	FC0L_206 S: 48
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

COMPOUND	LAB FLAG ¹	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
PFBA		40.0	39.9	99.8	1:50
PFPeA		20.0	19.8	98.8	4:24
PFHxA		10.0	9.53	95.3	5:00
PFHpA		10.0	9.79	97.9	5:27
PFOA		10.0	9.30	93.0	
PFNA		10.0	9.90	99.0	
PFDA		10.0	9.24	92.4	7:31
PFUnA		10.0	10.5	105	7:51
PFDoA		10.0	9.89	98.9	8:06
PFTrDA		10.0	9.60	96.0	8:24
PFTeDA		10.0	9.59	95.9	8:47
PFBS		10.0	9.98	99.8	4:57
PFPeS		10.0	9.77	97.7	5:29
PFHxS		10.0	9.53	95.3	
PFHpS		10.0	9.82	98.2	7:07
PFOS		10.0	9.45	94.5	
PFNS		10.0	11.1	111	7:56
PFDS		10.0	9.69	96.9	8:12
PFDoS	H	10.0	9.74	97.4	8:57
4:2 FTS		40.0	38.2	95.5	4:53
6:2 FTS		36.1	37.6	104	5:52
8:2 FTS		40.0	41.2	103	7:21
PFOSA		10.0	10.4	104	
N-MeFOSA		11.5	14.9	129	
N-EtFOSA		25.0	22.4	89.8	
MeFOSAA		10.0	9.89	98.9	
EtFOSAA		10.0	9.77	97.7	
N-MeFOSE	H	100	101	101	
N-EtFOSE	N	75.0	52.1	69.5	
HFPO-DA		38.0	35.5	93.5	5:09
ADONA		40.0	42.8	107	5:40
9CI-PF3ONS		40.0	40.3	101	7:51
11CI-PF3OUdS		40.0	41.5	104	8:26

(1) Where applicable, custom lab flags have been used on this report; N = authentic recovery in the OPR is not within method/contract control limits; H = concentration is estimated.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

SGS AXYS METHOD MLA-110 Rev 02

Form 8B

PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4066	Lab Sample I.D.:	WG72538-102
Matrix:	TISSUE	Initial Calibration Date:	18-Mar-2020
Extraction Date:	22-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	25-Jun-2020 Time: 08:39:38	Column ID:	C18
Extract Volume (uL):	4000	OPR Data Filename:	FC0L_206 S: 48
Injection Volume (uL):	2	Blank Data Filename:	FC0L_206 S: 50
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_206 S: 45

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
13C4-PFBA		40.0	32.3	80.7	1:49
13C5-PFPeA		20.0	17.9	89.4	4:24
13C5-PFHxA		10.0	8.30	83.0	5:00
13C4-PFHpA		10.0	7.92	79.2	5:27
13C8-PFOA		10.0	7.99	79.9	6:09
13C9-PFNA		5.00	4.03	80.7	7:01
13C6-PFDA		5.00	4.57	91.4	7:31
13C7-PFUnA		5.00	4.16	83.2	7:51
13C2-PFDmA		5.00	4.76	95.2	8:06
13C2-PFTeDA		5.00	4.10	82.0	8:47
13C3-PFBs		10.0	8.24	82.4	4:57
13C3-PFHxS		10.0	8.47	84.7	6:15
13C8-PFOS		10.0	9.03	90.3	7:37
13C2-4:2 FTS		20.0	32.9	164	4:53
13C2-6:2 FTS		20.0	20.9	104	5:52
13C2-8:2 FTS		20.0	35.5	178	7:21
13C8-PFOSA		10.0	10.0	100	8:44
D3-N-MeFOSA		10.0	1.14	11.4	10:08
D5-N-EtFOSA		10.0	5.11	51.1	10:26
D3-MeFOSAA		20.0	31.3	156	7:34
D5-EtFOSAA		20.0	39.2	196	7:43
d7-NMe-FOSE		100	7.72	7.72	10:00
d9-NEt-FOSE		100	27.5	27.5	10:18
13C3-HFPO-DA		40.0	32.4	81.1	5:09

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

For Axys Internal Use Only [XSL Template: FC-Form8B.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_WG72538-102_Form8B_SJ2757423.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02**Form 8G****CERTIFIED REFERENCE MATERIAL (CRM) REPORT FOR NIST SRM 1947****SGS AXYS ANALYTICAL SERVICES**

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4066	Lab Sample I.D.:	WG72538-103
Matrix:	TISSUE	Sample Size:	2.06 g (wet)
Extraction Date:	22-Jun-2020	Initial Calibration Date:	18-Mar-2020
Analysis Date:	25-Jun-2020 Time: 12:33:52	Instrument ID:	LCMS/MS
Extract Volume (uL):	4000	GC Column ID:	C18
Injection Volume (uL):	2	Sample Data Filename:	FC0L_206 S: 66
Dilution Factor:	N/A	Blank Data Filename:	FC0L_206 S: 50
Concentration Units:	ng/g (wet weight basis)	Cal. Ver. Data Filename:	FC0L_206 S: 45

COMPOUND	CAS. NO.	LAB FLAG¹	DETERMINED	CERTIFIED / REFERENCE
PFOS	45298-90-6		6.04	5.9 +/- 0.39

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

For Axys Internal Use Only [XSL Template: Pest8G.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8; Report Filename: _FC_LC_PFAS_WG72538-103_Form8G_SJ2757443.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 8H

CERTIFIED REFERENCE MATERIAL (CRM) REPORT FOR NIST SRM 1947

SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4066	Lab Sample I.D.:	WG72538-103
Matrix:	TISSUE	Sample Size:	2.06 g (wet)
Extraction Date:	22-Jun-2020	Initial Calibration Date:	18-Mar-2020
Analysis Date:	25-Jun-2020 Time: 12:33:52	Instrument ID:	LCMS/MS
Extract Volume (uL):	4000	GC Column ID:	C18
Injection Volume (uL):	2	Sample Data Filename:	FC0L_206 S: 66
Dilution Factor:	N/A	Blank Data Filename:	FC0L_206 S: 50
Concentration Units:	ng absolute	Cal. Ver. Data Filename:	FC0L_206 S: 45

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	ION ABUND. RATIO	RRT
13C4-PFBA		40.0	32.8	82.0		
13C5-PFPeA		20.0	19.3	96.4		
13C5-PFhxA		10.0	8.79	87.9		
13C4-PFhpA		10.0	8.10	81.0		
13C8-PFOA		10.0	8.28	82.8		
13C9-PFNA		5.00	4.01	80.2		
13C6-PFDA		5.00	4.45	89.0		
13C7-PFunA		5.00	4.24	84.7		
13C2-PFDaA		5.00	4.17	83.4		
13C2-PFTeDA		5.00	2.95	59.0		
13C3-PFBs		10.0	8.71	87.1		
13C3-PFhxs		10.0	8.42	84.2		
13C8-PFOS		10.0	9.54	95.4		
13C2-4:2 FTS		20.0	31.2	156		
13C2-6:2 FTS		20.0	27.7	138		
13C2-8:2 FTS		20.0	40.2	201		
13C8-PFOSA		10.0	10.4	104		
D3-N-MeFOSA		10.0	5.03	50.3		
D5-N-EtFOSA		10.0	3.25	32.5		
D3-MeFOSAA		20.0	32.0	160		
D5-EtFOSAA		20.0	34.1	170		
d7-NMe-FOSE		100	3.47	3.47		
d9-NEt-FOSE		100	16.4	16.4		
13C3-HFPO-DA		40.0	32.8	82.0		

(1) Where applicable, custom lab flags have been used on this report.

(2) R% = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

For Axys Internal Use Only [XSL Template: Pest8H.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
 Report Filename: _FC_LC_PFAS_WG72538-103_Form8H_SJ2757443.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 3A
LC MS/MS INITIAL CALIBRATION PERCENT RECOVERIES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC0L_082 S: 10

CS2 Data Filename: FC0L_082 S: 11

CS3 Data Filename: FC0L_082 S: 12

CS4 Data Filename: FC0L_082 S: 13

CS5 Data Filename: FC0L_082 S: 14

CS6 Data Filename: FC0L_082 S: 15

CS7 Data Filename: FC0L_082 S: 16

CS8 Data Filename: N/A

COMPOUND	LAB FLAG ¹	PERCENT RECOVERY (%)							
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7
PFBA		105	104	101	99.8	94.2	96.1	100	
PFPeA		102	105	100	101	94.3	97.4	100	
PFHxA		112	108	101	98.0	88.5	94.8	97.3	
PFHpA		115	110	97.6	92.5	92.6	96.9	95.4	
PFOA		118	111	103	91.3	86.1	95.5	94.8	
PFNA		105	98.7	97.9	105	90.6	98.1	105	
PFDA		103	112	99.4	96.1	93.4	91.8	104	
PFUnA		99.9	99.9	102	103	96.3	102	97.3	
PFDoA		100	97.1	88.5	125	102	104	83.9	
PFTrDA		94.2	106	103	114	95.7	87.5		
PFTeDA		119	111	106	105	95.9	87.9	74.8	
PFBS		102	108	101	103	94.0	93.8	98.1	
PFPeS		102	106	101	105	97.1	97.7	90.3	
PFHxS		101	103	101	97.2	91.2	97.3	109	
PFHpS		100	114	101	99.9	90.6	95.7	98.7	
PFOS		119	115	91.5	93.3	89.6	91.4	101	
PFNS		114	129	76.4	83.2	81.8	107	108	
PFDS		112	118	93.5	94.2	91.1	90.4	101	
PFDoS		99.1	117	97.2	99.1	91.9	93.7	102	
4:2 FTS		114	101	102	111	99.9	95.9	76.0	
6:2 FTS		110	117	98.7	100	91.5	82.6		
8:2 FTS		94.7	117	102	100	100	85.4		
PFOSA		109	103	96.9	98.6	94.3	96.3	102	
N-MeFOSA		92.0	116	108	109	98.9	96.2	80.2	
N-EtFOSA		96.6	112	99.7	97.5	95.4	97.1	102	
MeFOSAA		98.3	104	97.0	110	97.2	102	91.0	
EtFOSAA		121	80.0	110	102	93.5	91.3	102	
N-MeFOSE		107	106	103	101	94.2	95.5	93.8	
N-EtFOSE		101	105	107	102	95.3	96.9	93.0	
HFPO-DA		104	104	105	106	99.2	95.5	86.5	
ADONA		104	98.2	99.7	102	99.3	95.9	101	
9CI-PF3ONS		105	111	104	107	97.3	90.9	84.9	
11CI-PF3OUdS		106	109	101	98.1	94.7	94.3	96.9	

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

For Axys Internal Use Only [XSL Template: FC-Form3A.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
Report Filename: PFOA_FC_LC_18-Mar-2020_FC0L__Form3A_GS88044.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 3B
LC MS/MS INITIAL CALIBRATION PERCENT RECOVERIES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename:	N/A
CS1 Data Filename:	FC0L_082 S: 10
CS2 Data Filename:	FC0L_082 S: 11
CS3 Data Filename:	FC0L_082 S: 12
CS4 Data Filename:	FC0L_082 S: 13
CS5 Data Filename:	FC0L_082 S: 14
CS6 Data Filename:	FC0L_082 S: 15
CS7 Data Filename:	FC0L_082 S: 16
CS8 Data Filename:	N/A

LABELED COMPOUND	LAB FLAG ¹	PERCENT RECOVERIES (%)							
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7
13C4-PFBA		99.0	102	99.9	99.7	100	99.5	99.1	
13C5-PFPeA		108	106	104	105	103	94.5	79.2	
13C5-PFHxA		102	103	99.3	101	102	99.2	94.1	
13C4-PFHxA		95.2	106	105	106	106	94.9	86.8	
13C8-PFOA		97.0	101	103	101	106	95.5	95.7	
13C9-PFNA		97.7	105	104	99.3	97.3	102	95.1	
13C6-PFDA		114	108	82.8	113	106	98.3	77.0	
13C7-PFUuA		114	118	103	103	93.3	67.7		
13C2-PFDuA		111	111	96.0	85.8	98.6	94.8	103	
13C2-PFTeDA		97.0	102	95.6	94.2	94.1	99.3	118	
13C3-PFBS		97.7	112	105	102	101	99.2	82.6	
13C3-PFHxS		101	104	102	99.9	101	101	91.4	
13C8-PFOS		99.7	88.7	104	104	100	105	98.6	
13C2-4:2 FTS		105	116	109	96.6	73.2			
13C2-6:2 FTS		105	116	115	106	88.3	70.0		
13C2-8:2 FTS		111	116	116	114	85.5	71.7	85.6	
13C8-PFOSA		92.4	95.4	90.5	92.6	90.8	104	134	
D3-N-MeFOSA		97.8	101	88.3	95.5	100	118		
D5-N-EtFOSA		97.3	96.0	91.1	95.6	90.7	107	122	
D3-MeFOSAA		96.2	92.6	97.5	93.6	95.9	103	121	
D5-EtFOSAA		97.5	100	93.2	97.7	96.2	109	106	
d7-NMe-FOSE		95.8	95.8	89.7	96.2	95.8	107	120	
d9-NEt-FOSE		95.6	98.2	88.6	95.4	93.9	105	124	
13C3-HFPO-DA		109	110	110	107	101	90.0	72.7	

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

SGS AXYS METHOD MLA-110 Rev 02

Form 3C
LC MS/MS INITIAL CALIBRATION RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A
CS1 Data Filename: FC0L_082 S: 10

CS2 Data Filename: FC0L_082 S: 11

CS3 Data Filename: FC0L_082 S: 12

CS4 Data Filename: FC0L_082 S: 13

CS5 Data Filename: FC0L_082 S: 14

CS6 Data Filename: FC0L_082 S: 15

CS7 Data Filename: FC0L_082 S: 16

CS8 Data Filename: N/A

COMPOUND	LAB FLAG ¹	RETENTION TIMES								MEAN RT
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	
PFBA		1:58	1:58	1:58	1:58	1:58	1:58	1:58	1:58	1:58
PFPeA		4:19	4:19	4:19	4:19	4:19	4:19	4:19	4:19	4:19
PFHxA		4:54	4:54	4:53	4:53	4:54	4:54	4:54	4:54	4:54
PFHpA		5:23	5:23	5:23	5:23	5:23	5:23	5:23	5:24	5:23
PFOA		6:11	6:11	6:11	6:11	6:11	6:11	6:11	6:11	6:11
PFNA		7:02	7:03	7:02	7:03	7:02	7:02	7:02	7:02	7:02
PFDA		7:34	7:34	7:33	7:34	7:33	7:34	7:33	7:34	7:34
PFUnA		7:54	7:54	7:53	7:54	7:54	7:54	7:54	7:54	7:54
PFDoA		8:10	8:10	8:10	8:10	8:10	8:10	8:10	8:10	8:10
PFTrDA		8:30	8:30	8:29	8:29	8:30	8:30	8:30	8:30	8:30
PFTeDA		8:55	8:55	8:55	8:55	8:55	8:55	8:55	8:55	8:55
PFBS		4:51	4:51	4:51	4:51	4:51	4:51	4:51	4:51	4:51
PFPeS		5:25	5:26	5:25	5:25	5:25	5:25	5:26	5:26	5:25
PFHxS		6:17	6:17	6:17	6:17	6:17	6:17	6:17	6:17	6:17
PFHpS		7:09	7:09	7:09	7:09	7:09	7:09	7:09	7:09	7:09
PFOS		7:40	7:40	7:39	7:40	7:39	7:40	7:39	7:40	7:40
PFNS		7:59	7:59	7:59	7:59	7:59	7:59	7:59	7:59	7:59
PFDS		8:16	8:16	8:16	8:16	8:16	8:16	8:16	8:16	8:16
PFDoS		9:06	9:06	9:06	9:06	9:06	9:06	9:06	9:06	9:06
4:2 FTS		4:46	4:46	4:46	4:46	4:46	4:46	4:46	4:46	4:46
6:2 FTS		5:51	5:51	5:51	5:51	5:51	5:51	5:51	5:51	5:51
8:2 FTS		7:24	7:23	7:23	7:23	7:23	7:23	7:23	7:23	7:23
PFOSA		8:45	8:45	8:45	8:45	8:45	8:45	8:45	8:45	8:45
N-MeFOSA		10:12	10:12	10:12	10:12	10:12	10:12	10:12	10:12	10:12
N-EtFOSA		10:30	10:30	10:31	10:30	10:30	10:30	10:30	10:30	10:30
MeFOSAA		7:37	7:37	7:37	7:37	7:37	7:37	7:37	7:37	7:37
EtFOSAA		7:46	7:46	7:45	7:46	7:45	7:46	7:45	7:46	7:46
N-MeFOSE		10:04	10:03	10:04	10:04	10:04	10:04	10:04	10:04	10:04
N-EtFOSE		10:23	10:23	10:23	10:23	10:23	10:23	10:23	10:23	10:23
HFPO-DA		5:03	5:03	5:03	5:03	5:03	5:03	5:03	5:03	5:03
ADONA		5:38	5:38	5:38	5:38	5:38	5:38	5:38	5:38	5:38
9CI-PF3ONS		7:54	7:54	7:53	7:53	7:53	7:54	7:53	7:53	7:53
11CI-PF3OUdS		8:31	8:31	8:31	8:31	8:31	8:31	8:31	8:31	8:31

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

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Report Filename: PFOA_FC_LC_18-Mar-2020_FC0L_Form3C_GS88044.html; Workgroup: WG72538; Design ID: 3990]



SGS AXYS METHOD MLA-110 Rev 02

Form 3D
LC MS/MS INITIAL CALIBRATION RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A
CS1 Data Filename: FC0L_082 S: 10

CS2 Data Filename: FC0L_082 S: 11

CS3 Data Filename: FC0L_082 S: 12

CS4 Data Filename: FC0L_082 S: 13

CS5 Data Filename: FC0L_082 S: 14

CS6 Data Filename: FC0L_082 S: 15

CS7 Data Filename: FC0L_082 S: 16

CS8 Data Filename: N/A

LAB FLAG ¹	RETENTION TIMES								MEAN RT
	CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
LABELED COMPOUND									
13C4-PFBA	1:57	1:57	1:57	1:57	1:57	1:57	1:57	1:57	1:57
13C5-PFPeA	4:18	4:19	4:18	4:18	4:19	4:19	4:19	4:19	4:19
13C5-PFHxA	4:53	4:53	4:53	4:53	4:53	4:54	4:54	4:53	4:53
13C4-PFHpA	5:23	5:23	5:23	5:23	5:23	5:23	5:23	5:23	5:23
13C8-PFOA	6:11	6:11	6:11	6:11	6:11	6:11	6:11	6:11	6:11
13C9-PFNA	7:02	7:02	7:02	7:02	7:02	7:02	7:02	7:02	7:02
13C6-PFDA	7:34	7:34	7:33	7:34	7:33	7:33	7:33	7:33	7:33
13C7-PFUnA	7:54	7:54	7:53	7:54	7:53	7:54	7:54	7:54	7:54
13C2-PFDaA	8:10	8:10	8:10	8:10	8:10	8:10	8:10	8:10	8:10
13C2-PFTeDA	8:55	8:55	8:55	8:55	8:55	8:55	8:55	8:55	8:55
13C3-PFBS	4:51	4:51	4:51	4:51	4:51	4:51	4:51	4:51	4:51
13C3-PFHxS	6:17	6:17	6:17	6:17	6:17	6:17	6:17	6:17	6:17
13C8-PFOS	7:40	7:40	7:39	7:40	7:39	7:40	7:39	7:40	7:40
13C2-4:2 FTS	4:46	4:46	4:46	4:46	4:46	4:46			4:46
13C2-6:2 FTS	5:51	5:51	5:51	5:51	5:51	5:51			5:51
13C2-8:2 FTS	7:23	7:24	7:23	7:23	7:23	7:23			7:23
13C8-PFOSA	8:45	8:45	8:45	8:45	8:45	8:45			8:45
D3-N-MeFOSA	10:11	10:11	10:12	10:11	10:12	10:11			10:11
D5-N-EtFOSA	10:30	10:30	10:30	10:30	10:30	10:30			10:30
D3-MeFOSAA	7:37	7:37	7:37	7:37	7:37	7:37			7:37
D5-EtFOSAA	7:45	7:45	7:45	7:45	7:45	7:45			7:45
d7-NMe-FOSE	10:03	10:02	10:03	10:03	10:03	10:03			10:03
d9-NEt-FOSE	10:22	10:22	10:22	10:22	10:22	10:22			10:22
13C3-HFPO-DA	5:03	5:03	5:03	5:03	5:03	5:03			5:03

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

For Axys Internal Use Only [XSL Template: FC-Form3D.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
Report Filename: PFOA_FC_LC_18-Mar-2020_FC0L_Form3D_GS88044.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 4A
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date:	18-Mar-2020	VER Data Filename:	FC0L_206 S: 45
Instrument ID:	LCMS/MS	Analysis Date:	25-Jun-2020
LC Column ID:	C18	Analysis Time:	08:00:31

COMPOUND	LAB FLAG¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
PFBA		1:53	40.0	38.8	96.9
PFPeA		4:25	20.0	19.0	94.9
PFHxA		5:01	10.0	9.64	96.4
PFHpA		5:28	10.0	9.20	92.0
PFOA		6:11	10.0	9.17	91.7
PFNA		7:01	10.0	9.95	99.5
PFDA		7:32	10.0	9.34	93.4
PFUnA		7:51	10.0	9.58	95.8
PFDoA		8:06	10.0	9.56	95.6
PFTrDA		8:25	10.0	9.28	92.8
PFTeDA		8:48	10.0	10.2	102
PFBS		4:58	10.0	9.19	91.9
PFPeS		5:29	10.0	10.9	109
PFHxS		6:16	10.0	10.2	102
PFHpS		7:08	10.0	9.12	91.2
PFOS		7:38	10.0	9.12	91.2
PFNS		7:56	10.0	8.51	85.1
PFDS		8:12	10.0	9.52	95.2
PFDoS		8:59	10.0	9.62	96.2
4:2 FTS		4:53	40.0	43.0	108
6:2 FTS		5:53	36.0	35.3	98.2
8:2 FTS		7:22	40.0	37.9	94.8
PFOSA		8:43	10.0	9.58	95.8
N-MeFOSA		10:09	11.5	12.6	109
N-EtFOSA		10:26	25.0	22.8	91.3
MeFOSAA		7:35	10.0	10.7	107
EtFOSAA		7:43	10.0	10.8	108
N-MeFOSE		10:01	100	99.2	99.2
N-EtFOSE		10:20	75.0	74.6	99.5
HFPO-DA		5:09	40.0	40.2	100
ADONA		5:41	40.0	42.6	107
9CI-PF3ONS		7:51	40.0	42.9	107
11CI-PF3OUdS		8:26	40.0	41.2	103

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form4A.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
 Report Filename: PFOA_FC_LC_FC0L_206S45__Form4A_SJ2757420.html; Workgroup: WG72538; Design ID: 3990]

SGS AXYS METHOD MLA-110 Rev 02

Form 4B
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date:	18-Mar-2020	VER Data Filename:	FC0L_206 S: 45
Instrument ID:	LCMS/MS	Analysis Date:	25-Jun-2020
LC Column ID:	C18	Analysis Time:	08:00:31

LABELED COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
13C4-PFBA		1:52	40.0	39.1	97.8
13C5-PFPeA		4:24	20.0	21.6	108
13C5-PFHxA		5:00	10.0	9.94	99.4
13C4-PFHpA		5:28	10.0	10.9	109
13C8-PFOA		6:10	10.0	9.93	99.3
13C9-PFNA		7:01	5.00	5.04	101
13C6-PFDA		7:32	5.00	4.98	99.5
13C7-PFUnA		7:51	5.00	5.00	100
13C2-PFDaA		8:06	5.00	5.33	107
13C2-PFTeDA		8:48	5.00	4.50	90.1
13C3-PFBS		4:58	9.18	9.95	108
13C3-PFHxS		6:16	10.0	10.2	102
13C8-PFOS		7:37	10.0	10.4	104
13C2-4:2 FTS		4:53	20.0	17.3	86.6
13C2-6:2 FTS		5:53	20.0	18.4	91.9
13C2-8:2 FTS		7:22	20.0	21.5	108
13C8-PFOSA		8:43	10.0	13.5	135
D3-N-MeFOSA		10:08	10.0	11.0	110
D5-N-EtFOSA		10:26	10.0	10.8	108
D3-MeFOSAA		7:35	20.0	21.7	108
D5-EtFOSAA		7:43	20.0	24.0	120
d7-NMe-FOSE		10:00	100	141	141
d9-NEt-FOSE		10:18	100	124	124
13C3-HFPO-DA		5:09	40.0	39.3	98.1

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Bryan Alonzo _____

For Axys Internal Use Only [XSL Template: FC-Form4B.xsl; Created: 22-Jul-2020 10:23:07; Application: XMLTransformer-1.18.8;
 Report Filename: PFOA_FC_LC_FC0L_206S45__Form4B_SJ2757420.html; Workgroup: WG72538; Design ID: 3990]

Accreditation Scope
SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 50

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SGS AXYS Analytical Services Ltd.
file ref: ACC-101 Rev. 50

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum								Solids				
				CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE
Endrin aldehyde	EPA 608	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8081	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8081	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Endrin ketone	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8081	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8081	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8081	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
GammahCH (Undane)	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Heptachlor	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Tissue
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Hexachlorobenzene	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Urine
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 808	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Methoxychlor	EPA 608	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Water	
	EPA 8081	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 1699	MLA-028	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Minex	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Water, Non-Potable	
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Oxydorane	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	AFF
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Tropane	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
trans-Chlorodane (gamma-Chlorodane)	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Page 3 of 34
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
trans-Nonachlor	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Page 48 of 79
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 82	MLA-007	SGS AXYS MLA-028	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
	EPA 82	MLA-007	SGS AX													

Accreditation Scope
SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 50

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum		Solids
				CALA	Alaska DEC ANAB DoD ** ANAB ISO 17025	
C1-Pheanthrenes/Antrazenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Benz(a)anthracenes/Cintronenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Benzo(a)anthracenes/Benzopyrenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Biphenyl		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Dibenzanthracene		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Dibenzanthracenes/Pyrenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Fluoranthrenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Naphthalenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C2-Pheanthrenes/Antrazenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C3-Benz(a)anthracenes/Cintronenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C3-Dibenzanthracene		SGS AXYS MLA-021	MLA-021	Y	Y	
C3-Fluoranthrenes/Pyrenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C3-Hydroxyenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C3-Naphthalenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C3-Pheanthrenes/Antrazenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C4-Benz(a)anthracenes/Cintronenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C4-Dibenzanthracene		SGS AXYS MLA-021	MLA-021	Y	Y	
C4-Fluoranthrenes/Pyrenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C4-Naphthalenes		SGS AXYS MLA-021	MLA-021	Y	Y	
C4-Pheanthrenes/Antrazenes		SGS AXYS MLA-021	MLA-021	Y	Y	
Chrysene		EPA 1625	MLA-021	Y	Y	
Dibenz(a)anthracene		SGS AXYS MLA-021	MLA-021	Y	Y	
Fluorene		EPA 1625	MLA-021	Y	Y	
Dibenzothiophene		SGS AXYS MLA-021	MLA-021	Y	Y	
Fluoranthene		SGS AXYS MLA-021	MLA-021	Y	Y	
Indeno[1,2,3-cd]pyrene		EPA 1625	MLA-021	Y	Y	
Naphthalene		EPA 1625	MLA-021	Y	Y	
Pyrene		EPA 1625	MLA-021	Y	Y	
Perylene		SGS AXYS MLA-021	MLA-021	Y	Y	
Phenanthrene		SGS AXYS MLA-021	MLA-021	Y	Y	
Retene		SGS AXYS MLA-021	MLA-021	Y	Y	
BDE-10,2,6-dibromodiphenylether		EPA 1614	MLA-033	Y	Y	
BDE-10,2,2,4,4'-pentabromodiphenylether		SGS AXYS MLA-033	MLA-033	Y	Y	
BDE-10,2,2,4,4'-pentabromodiphenylether		EPA 1614	MLA-033	Y	Y	
BDE-10,2,3,3',4,4'-hexabromodiphenylether		SGS AXYS MLA-033	MLA-033	Y	Y	
BDE-11,3,3'-dibromodiphenylether		EPA 1614	MLA-033	Y	Y	
BDE-12,3,4-dibromodiphenylether		SGS AXYS MLA-033	MLA-033	Y	Y	
BDE-12,3,3,4,4'-pentabromodiphenylether		EPA 1614	MLA-033	Y	Y	
BDE-12,3,3,4,4'-pentabromodiphenylether		SGS AXYS MLA-033	MLA-033	Y	Y	
BDE-13,3,4-dibromodiphenylether		EPA 1614	MLA-033	Y	Y	
BDE-13,3,4-dibromodiphenylether		SGS AXYS MLA-033	MLA-033	Y	Y	

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum								Solids			
				CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS
PCB 23/34	PCB 23,6-Trichlorobiphenyl	EPA 8270	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 24/27	PCB 24,2,3,6-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 25/28	PCB 25,2,3,4-Trichlorobiphenyl	EPA 8270	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 26/28	PCB 26,2,3,5-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 27/28	PCB 27,2,3,6-Trichlorobiphenyl	EPA 8270	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 28/29	PCB 28,2,4,4-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 29/30	PCB 29,2,4,5-Trichlorobiphenyl	EPA 8270	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 30/31	PCB 30,2,4,5-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 31/32	PCB 31,2,4,5-Trichlorobiphenyl	EPA 8270	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 32/33	PCB 32,2,4,5-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 33/34	PCB 33,2,4,5-Trichlorobiphenyl	EPA 8270	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 34/35	PCB 34,2,3,5-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 35/36	PCB 35,3,3,4-Trichlorobiphenyl	EPA 1668	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Compound Class	Compound	Serum									
		Solids					Tissue				
		Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 36,3,3,5-Trichlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 37,3,4,4-Trichlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 38,3,4,5-Trichlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 39,3,4,5-Trichlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 4,2-Dichlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 4,10	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
PCB 40,2,2,3,3-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-007	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 41,2,2,3,4-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 41,17,16,6,6,8	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
PCB 42,2,2,3,4-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 42,259	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
PCB 43,2,2,3,5-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 44,2,2,3,5-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-007	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 45,2,2,3,6-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-007	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y
PCB 46,2,2,3,6-Tetrachlorobiphenyl	EPA 1668	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	EPA 8270	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-010	MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-007	MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-210	MLA-210	MLA-210	Y	Y	Y	Y	Y	Y	Y	Y
	SGS AXYS MLA-908	MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y

Accreditation Scope
SGS AXYS Analytical Services Ltd.
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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum								Solids			
				CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS
PCB 59,2,3,3',5-Tetrachlorobiphenyl	EPA 1668	SGS AXYS MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 59,2,3,3',6-Tetrachlorobiphenyl	EPA 8270	SGS AXYS MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 6,2,3-Dichlorobiphenyl	EPA 1668	SGS AXYS MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 60,2,3,4,4'-Tetrachlorobiphenyl	EPA 8270	SGS AXYS MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 61,2,3,4,5-Tetrachlorobiphenyl	EPA 1668	SGS AXYS MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 62,2,3,4,6-Tetrachlorobiphenyl	EPA 8270	SGS AXYS MLA-008	MLA-008	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 64,2,3,4,6-Tetrachlorobiphenyl	EPA 1668	SGS AXYS MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 65,16,6-Tetrachlorobiphenyl	EPA 8270	SGS AXYS MLA-008	MLA-008	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 67,2,3,4,5-Tetrachlorobiphenyl	EPA 1668	SGS AXYS MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 68,2,3,4,5-Tetrachlorobiphenyl	EPA 1668	SGS AXYS MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 69,2,3,4,5-Tetrachlorobiphenyl	EPA 1668	SGS AXYS MLA-010	MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
PCB 7,2,4-Dichlorobiphenyl	EPA 1668	SGS AXYS MLA-908	MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Accreditation Scope

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum								Solids
				CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Maine DOH	Minnesota DOH	
PCB 81,3,4,5-Tetrachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-007	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 82,2,2,3,3,4-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-007	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 83,2,2,3,3,4-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 83,2,2,3,3,4-Pentachlorobiphenyl	EPA 8270	MLA-007	SGS AXYS MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 84,2,2,3,3,6-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Tissue
	EPA 8270	MLA-007	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 85,2,2,3,3,4-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 85,2,2,3,3,4,5-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 85,120	EPA 8270	MLA-007	SGS AXYS MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 86,2,2,3,4,5-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Urine
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 87,115,116	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 88,2,2,3,4,6-Pentachlorobiphenyl	EPA 8270	MLA-007	SGS AXYS MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 88,121	EPA 8270	MLA-007	SGS AXYS MLA-007	Y	Y	Y	Y	Y	Y	Y	Y	Water
PCB 89,2,2,3,4,6-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 9,2,5-Dichlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 90,2,2,3,4,5-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 91,2,2,3,4,6-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	Water, Non-Potable
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 92,2,2,3,5,5-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	EPA 8270	MLA-007	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
	SGS AXYS MLA-908	MLA-908	SGS AXYS MLA-908	Y	Y	Y	Y	Y	Y	Y	Y	
PCB 93,2,2,3,5,6-Pentachlorobiphenyl	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	AFFF
	SGS AXYS MLA-210	MLA-210	SGS AXYS MLA-210	Y	Y	Y	Y	Y	Y	Y	Y	
ACC-103 Rev. 53, 26-Jun-2020	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	ANAB DoD **
ACC-103 Rev. 53, 26-Jun-2020	EPA 1668	MLA-010	SGS AXYS MLA-010	Y	Y	Y	Y	Y	Y	Y	Y	ANAB ISO 17025

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Serum Solids		Tissue
					Alaska DEC	ANAB DoD **	
OCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	ANAB ISO 17025
OCDF	SGS AXYS MLA-217	MLA-017	Y	Y	Y	Y	CALA
OCPDF	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	California WB
Total HxCDF	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	Florida DOH
Total HxCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	Maine DOH
Total HxCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	Minnesota DOH
Total HxCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	New Jersey DEP
Total HxCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	New York DOH
Total HxCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	Virginia DGS
Total HxCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	Washington DE
Total HxCDF	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	ANAB DoD **
Total HxCDF	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	ANAB ISO 17025
Total HxCDF	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	CALA
Total HxCDF	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	Florida DOH
Total HxCDF	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	Minnesota DOH
Total HxCDF	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	New Jersey DEP
Total HxCDF	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	Virginia DGS
Total PCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	CALA
Total PCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	Urine
Total PCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	Water
Total PCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	Water, Non-Potable
Total PCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	Alaska DEC
Total PCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	ANAB DoD **
Total PCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	ANAB ISO 17025
Total PCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	CALA
Total PCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	Florida DOH
Total PCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	Minnesota DOH
Total PCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	New Jersey DEP
Total PCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	New York DOH
Total PCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	Pennsylvania DEP
Total PCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	Virginia DGS
Total PCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Y	Washington DE *
PFAS	Per- and Polyfluorinated Alkyl Substances (PFAS) "category (Ca only)"	DotQSN Version S.1	MLA-010	Y	Y	Y	ANAB DoD **
PFAS	11-Chlorotetradecano-3-oxaundecane- α -sulfonate (11-O-PF30US)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	ANAB ISO 17025
PFAS	11-Chlorotetradecano-3-oxaundecane- β -sulfonate (11-O-PF30US)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	CALA
PFAS	11-Chlorotetradecano-3-oxaundecane- β -sulfonate (11-O-PF30US)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	California WB
PFAS	4,8-Dioxa-3-hydroperfluoropanamic acid (ADOMA)	SGS AXYS MLA-017	MLA-017	Y	Y	Y	Florida DOH
PFAS	4,8-Dioxa-3-hydroperfluoropanamic acid (ADOMA)	SGS AXYS MLA-217	MLA-017	Y	Y	Y	Maine DOH
PFAS	4,8-Dioxa-3-hydroperfluoropanamic acid (ADOMA)	SGS AXYS MLA-217	MLA-017	Y	Y	Y	Minnesota DOH
PFAS	4,8-Dioxa-3-hydroperfluoropanamic acid (ADOMA)	SGS AXYS MLA-217	MLA-017	Y	Y	Y	New Jersey DEP
PFAS	4,8-Dioxa-3-hydroperfluoropanamic acid (ADOMA)	SGS AXYS MLA-217	MLA-017	Y	Y	Y	New York DOH
PFAS	4,8-Dioxa-3-hydroperfluoropanamic acid (ADOMA)	SGS AXYS MLA-217	MLA-017	Y	Y	Y	Pennsylvania DEP
PFAS	4,8-Dioxa-3-hydroperfluoropanamic acid (ADOMA)	SGS AXYS MLA-217	MLA-017	Y	Y	Y	Virginia DGS
PFAS	4,8-Dioxa-3-hydroperfluoropanamic acid (ADOMA)	SGS AXYS MLA-217	MLA-017	Y	Y	Y	Washington DE *
PFAS	Heptafluoropropene oxide dimer aceto, anion and acid (HFPO-DA)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	ANAB DoD **
PFAS	Heptafluoropropene oxide dimer aceto, anion and acid (HFPO-DA)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	ANAB ISO 17025
PFAS	Heptafluoropropene oxide dimer acid (HFPO-DA)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	CALA
PFAS	Heptafluoropropene oxide dimer acid (HFPO-DA)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	California WB
PFAS	6,2 Fluorotetradecano-3-sulfonate (6,2-FTS)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	Florida DOH
PFAS	8,2 Fluorotetradecano-3-sulfonate (8,2-FTS)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	Maine DOH
PFAS	9-Phenoxeketadecano-3-oxanone- α -sulfonate (9CIP-30NS)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	Minnesota DOH
PFAS	9-Phenoxeketadecano-3-oxanone- β -sulfonate (9CIP-30NS)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	New Jersey DEP
PFAS	9-Chloroketadecano-3-oxanone- β -sulfonate (9CIP-30NS)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	New York DOH
PFAS	9-Chloroketadecano-3-oxanone- β -sulfonate (9CIP-30NS)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	Pennsylvania DEP
PFAS	9-Chloroketadecano-3-oxanone- β -sulfonate (9CIP-30NS)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	Virginia DGS
PFAS	9-Chloroketadecano-3-oxanone- β -sulfonate (9CIP-30NS)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	Washington DE *
PFAS	Heptafluoropropene oxide dimers (HFPO-DD)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	ANAB DoD **
PFAS	Heptafluoropropene oxide dimers (HFPO-DD)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	ANAB ISO 17025
PFAS	Heptafluoropropene oxide dimers (HFPO-DD)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	CALA
PFAS	Heptafluoropropene oxide dimers (HFPO-DD)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	California WB
PFAS	N-Ethylperfluorooctane sulfonamide (N-EtFO-SO ₂)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	Florida DOH
PFAS	N-Ethylperfluorooctane sulfonamide (N-EtFO-SO ₂)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	Maine DOH
PFAS	N-Ethylperfluorooctane sulfonamide (N-EtFO-SO ₂)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	Minnesota DOH
PFAS	N-Ethylperfluorooctane sulfonamide (N-EtFO-SO ₂)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	New Jersey DEP
PFAS	N-Ethylperfluorooctane sulfonamide (N-EtFO-SO ₂)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	New York DOH
PFAS	N-Methylperfluorooctanesulfonamidoacetic acid (N-MeFO-SO ₂ CA)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	Pennsylvania DEP
PFAS	N-Methylperfluorooctanesulfonamidoacetic acid (N-MeFO-SO ₂ CA)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	Virginia DGS
PFAS	N-Methylperfluorooctanesulfonamidoacetic acid (N-MeFO-SO ₂ CA)	SGS AXYS MLA-110	MLA-010	Y	Y	Y	Washington DE *
PFAS	Perfluorooctane sulfonate (PFBS)	SGS AXYS MLA-060	MLA-060	Y	Y	Y	ANAB DoD **
PFAS	Perfluorooctane sulfonate (PFBS)	SGS AXYS MLA-060	MLA-060	Y	Y	Y	ANAB ISO 17025

Accreditation Scope
SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 50

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum		Solids
				CALA	Alaska DEC	
PPCP	Perfluoroundecanoate (PFUnDA)	SGS AXYS MLA-110	MLA-110	Y	Y	
	Perfluoroundecanoate (PFUuPA)	SGS AXYS MLA-060	MLA-060	Y	Y	
	2-Hydroxyisobutyron	SGS AXYS MLA-041	MLA-041	Y	Y	
	4-Epoxymydroxymonotetracycline (EAC-TG)	SGS AXYS MLA-043	MLA-043	Y	Y	
	4-Epoxymycofetetracycline (EATC)	SGS AXYS MLA-042	MLA-042	Y	Y	
	1,7-Dimethylxanthine	SGS AXYS MLA-110	MLA-110	Y	Y	
	10-Hydroxy- <i>o</i> -nitrophenylamine	SGS AXYS MLA-075	MLA-075	Y	Y	
	2-Hydroxyisobutyron	SGS AXYS MLA-075	MLA-075	Y	Y	
	4-Epoxymycofetetracycline (EAC-TG)	SGS AXYS MLA-075	MLA-075	Y	Y	
	4-Epoxymycofetetracycline (EATC)	SGS AXYS MLA-075	MLA-075	Y	Y	
	Acetaminophen	SGS AXYS MLA-075	MLA-075	Y	Y	
	4-Epoxibiotetracycline (ECTC)	SGS AXYS MLA-075	MLA-075	Y	Y	
	Albuterol	SGS AXYS MLA-075	MLA-075	Y	Y	
	Abrazolam	SGS AXYS MLA-075	MLA-075	Y	Y	
	Antidiopine	SGS AXYS MLA-075	MLA-075	Y	Y	
	Antiphetamine	SGS AXYS MLA-075	MLA-075	Y	Y	
	Antydrochlorotetracycline (ACTC)	SGS AXYS MLA-075	MLA-075	Y	Y	
	Antyhydrocyclopiine (ATC)	SGS AXYS MLA-075	MLA-075	Y	Y	
	Atenadol	SGS AXYS MLA-075	MLA-075	Y	Y	
	Atorvastatin	SGS AXYS MLA-075	MLA-075	Y	Y	
	Azithromycin	SGS AXYS MLA-075	MLA-075	Y	Y	
	Benzoylsgopine	SGS AXYS MLA-075	MLA-075	Y	Y	
	Benztopine	SGS AXYS MLA-075	MLA-075	Y	Y	
	Bethanehtosone	SGS AXYS MLA-075	MLA-075	Y	Y	
	Bisphenol A	SGS AXYS MLA-075	MLA-075	Y	Y	
	Caffeine	SGS AXYS MLA-075	MLA-075	Y	Y	
	Carboxax	SGS AXYS MLA-075	MLA-075	Y	Y	
	Carbamazepine	SGS AXYS MLA-075	MLA-075	Y	Y	
	Cefazoxime	SGS AXYS MLA-075	MLA-075	Y	Y	
	Chlortetracycline (CTC)	SGS AXYS MLA-075	MLA-075	Y	Y	
	Cimetidine	SGS AXYS MLA-075	MLA-075	Y	Y	
	Ciprofloxacin	SGS AXYS MLA-075	MLA-075	Y	Y	
	Cloxacillin	SGS AXYS MLA-075	MLA-075	Y	Y	
	Clarithromycin	SGS AXYS MLA-075	MLA-075	Y	Y	
	Chlatoxin	SGS AXYS MLA-075	MLA-075	Y	Y	
	Cocaine	SGS AXYS MLA-075	MLA-075	Y	Y	
	Codeline	SGS AXYS MLA-075	MLA-075	Y	Y	
	Cotinine	SGS AXYS MLA-075	MLA-075	Y	Y	
	DeET (N,N-diethyl-n-toluamide)	SGS AXYS MLA-075	MLA-075	Y	Y	
	Dehydrofurfuripine	SGS AXYS MLA-075	MLA-075	Y	Y	
	Demeclocycline	SGS AXYS MLA-075	MLA-075	Y	Y	
	Desmethylclizoxazin	SGS AXYS MLA-075	MLA-075	Y	Y	

Compound Class	Compound	Accredited Method ID		CALA	Serum
		SGS AXYS MLA-075	MLA-075		
Diazepam		EPA 16.94	MLA-075	Y	Y
Digoxin		EPA 16.94	MLA-075	Y	Y
Diltiazem		EPA 16.94	MLA-075	Y	Y
Diphenhydramine		EPA 16.94	MLA-075	Y	Y
Dowycaine		EPA 16.94	MLA-075	Y	Y
Eralapril		EPA 16.94	MLA-075	Y	Y
Enrofloxacin		EPA 16.94	MLA-075	Y	Y
Erythromycin		EPA 16.94	MLA-075	Y	Y
Erythromycin azuolate		EPA 16.94	MLA-075	Y	Y
Flumequine		EPA 16.94	MLA-075	Y	Y
Fluconazole		EPA 16.94	MLA-075	Y	Y
Fluoxetine		EPA 16.94	MLA-075	Y	Y
Fluticasone propionate		EPA 16.94	MLA-075	Y	Y
Furosemide		EPA 16.94	MLA-075	Y	Y
Gemfibrozil		EPA 16.94	MLA-075	Y	Y
Glipizide		EPA 16.94	MLA-075	Y	Y
Glibenclamide		EPA 16.94	MLA-075	Y	Y
Hydrochlorothiazide		EPA 16.94	MLA-075	Y	Y
Hydrocodone		EPA 16.94	MLA-075	Y	Y
Hydrocortisone		EPA 16.94	MLA-075	Y	Y
Ibuprofen		EPA 16.94	MLA-075	Y	Y
Ischionotetacycline (ICTC)		EPA 16.94	MLA-075	Y	Y
Lincosycin		EPA 16.94	MLA-075	Y	Y
Lomefloxacin		EPA 16.94	MLA-075	Y	Y
Meprobamate		EPA 16.94	MLA-075	Y	Y
Metformin		EPA 16.94	MLA-075	Y	Y
Methylprednisolone		EPA 16.94	MLA-075	Y	Y
Methotrexate		EPA 16.94	MLA-075	Y	Y
Miconazole		EPA 16.94	MLA-075	Y	Y
Minoxidil		EPA 16.94	MLA-075	Y	Y
Naproxen		EPA 16.94	MLA-075	Y	Y
Nonoxokin		EPA 16.94	MLA-075	Y	Y
Norfluroxine		EPA 16.94	MLA-075	Y	Y
Norgestimimate		EPA 16.94	MLA-075	Y	Y
Nonverapamil		EPA 16.94	MLA-075	Y	Y
Oroxacin		EPA 16.94	MLA-075	Y	Y
Ometoprim		EPA 16.94	MLA-075	Y	Y
Oxacillin		EPA 16.94	MLA-075	Y	Y
Oxalic acid		EPA 16.94	MLA-075	Y	Y
Oxydone		EPA 16.94	MLA-075	Y	Y
Oxotetracycline (OTC)		EPA 16.94	MLA-075	Y	Y
Paroxetine		EPA 16.94	MLA-075	Y	Y
Penicillin G		EPA 16.94	MLA-075	Y	Y
Penicillin V		EPA 16.94	MLA-075	Y	Y

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Serum
Prednisolone		SGS AXYS MLA-075	MLA-075	Alaska DEC ANAB DoD ** ANAB ISO 17025	Solids
Prednisone		SGS AXYS MLA-075	MLA-075	CALA	
Promethazine		SGS AXYS MLA-075	MLA-075	California WB	
Propoxyphene		SGS AXYS MLA-075	MLA-075	Florida DOH	
Propriofenol		SGS AXYS MLA-075	MLA-075	Maine DOH	
Ranitidine	EPA 1694	MLA-075	MLA-075	Minnesota DOH	
Roxithromycin	EPA 1694	MLA-075	MLA-075	New Jersey DEP	
Sabatoxacin	EPA 1694	MLA-075	MLA-075	New York DOH	
Sertindole		SGS AXYS MLA-075	MLA-075	Virginia DGS	
Simvastatin		SGS AXYS MLA-075	MLA-075	Washington DE	
Sulfachloropyridazine		SGS AXYS MLA-075	MLA-075	ANAB DoD ** ANAB ISO 17025	Tissue
Sulfadiazine	EPA 1694	MLA-075	MLA-075	CALA	Urine
Sulfamethizole		SGS AXYS MLA-075	MLA-075	CALA	Water
Sulfadimethoxine	EPA 1694	MLA-075	MLA-075	Alaska DEC ANAB DoD ** ANAB ISO 17025	Water, Non-Potable
Sulfamerazine	EPA 1694	MLA-075	MLA-075	CALA	
Sulfameturazine	EPA 1694	MLA-075	MLA-075	California WB	
Sulfameturamide	EPA 1694	MLA-075	MLA-075	Florida DOH	
Sulfathiazole	EPA 1694	MLA-075	MLA-075	Maine DOH	
Sulfamethoxazole	EPA 1694	MLA-075	MLA-075	Minnesota DOH	
Sulfamerazine	EPA 1694	MLA-075	MLA-075	New Jersey DEP	
Sulfameturamide	EPA 1694	MLA-075	MLA-075	New York DOH	
Sulfathiazole	EPA 1694	MLA-075	MLA-075	Virginia DGS	
Tetracycline (TC)	EPA 1694	MLA-075	MLA-075	Washington DE	
Thiophendione		SGS AXYS MLA-075	MLA-075	ANAB DoD ** ANAB ISO 17025	
Thiobendazole		SGS AXYS MLA-075	MLA-075	CALA	
Trematolone	EPA 1694	MLA-075	MLA-075	Florida DOH	
Trembolone acetate		SGS AXYS MLA-075	MLA-075	Minnesota DOH	
Triamterene		SGS AXYS MLA-075	MLA-075	New Jersey DEP	
Tridoctran	EPA 1694	MLA-075	MLA-075	New York DOH	
Triobsan	EPA 1694	MLA-075	MLA-075	Pennsylvania DEP	
Trimethoprim	EPA 1694	MLA-075	MLA-075	Virginia DGS	
Tyrosin	EPA 1694	MLA-075	MLA-075	Washington DE *	
Vasartan		SGS AXYS MLA-075	MLA-075	ANAB DoD ** ANAB ISO 17025	AFFF
Velegam		SGS AXYS MLA-075	MLA-075		
Virginiamycin	EPA 1694	MLA-075	MLA-075		
Warfarin		SGS AXYS MLA-075	MLA-075		
Targeted Metabolites	11-14, 17-eicosatetenoic acid (eicosatrienoic acid)	SGS AXYS MLA-075	MLA-075		
	11,14-eicosadienoic acid	SGS AXYS MLA-001	MLM-001		
	3-hydroxyvitamine	SGS AXYS MLA-001	MLM-001		
	Acetylornithine	SGS AXYS MLA-001	MLM-001		
	Alanine	SGS AXYS MLA-001	MLM-001		
	alpha-Aminoadipic acid	SGS AXYS MLA-001	MLM-001		
	Arginine	SGS AXYS MLA-001	MLM-001		
	Asparagine	SGS AXYS MLA-001	MLM-001		
	Aspartate	SGS AXYS MLA-001	MLM-001		
	Asymmetric dimethylarginine	SGS AXYS MLA-001	MLM-001		
	Butyrylcaprolactone	SGS AXYS MLA-001	MLM-001		
	Butyrylcarnitine	SGS AXYS MLA-001	MLM-001		
	C22:8 ISOMER 1 (tentatively all-cis-4, 8, 12, 15, 19-docosapentaenoic acid)	SGS AXYS MLA-001	MLM-001		
	C22:8 ISOMER 2 (all-cis-7, 10, 13, 16-docosapentaenoic acid (DPA))	SGS AXYS MLA-001	MLM-001		
	C22:8 ISOMER 3 (tentatively all-cis-4, 7, 10, 13, 16-docosapentaenoic acid)	SGS AXYS MLA-001	MLM-001		
	Carnitine	SGS AXYS MLA-001	MLM-001		
	Carnosine	SGS AXYS MLA-001	MLM-001		
	Carnosoycarnitine	SGS AXYS MLA-001	MLM-001		
	Carnosylcarnitine	SGS AXYS MLA-001	MLM-001		
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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Serum
Chlorine	Choline	SGS AXYS MLM-001	MLM-001	Y	
Decanoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Decanoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Dodecanoylethanol acid (carnic acid)		SGS AXYS MLM-001	MLM-001	Y	
Deoxycarnitine		SGS AXYS MLM-001	MLM-001	Y	
Decenoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Deoxycholic acid		SGS AXYS MLM-001	MLM-001	Y	
Docosahexaenoic acid (DHA)		SGS AXYS MLM-001	MLM-001	Y	
Docosatetraenoic acid (eicosanoic acid)		SGS AXYS MLM-001	MLM-001	Y	
Dodecanoylethanol acid (carnic acid)		SGS AXYS MLM-001	MLM-001	Y	
Dodecanoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Dodecetylcamitine		SGS AXYS MLM-001	MLM-001	Y	
Dopamine		SGS AXYS MLM-001	MLM-001	Y	
Eicosapentaenoic acid (EPA)		SGS AXYS MLM-001	MLM-001	Y	
Eicosatetraenoic acid (arachidonic acid)		SGS AXYS MLM-001	MLM-001	Y	
Eicosatrienoic acid (linoleo- α -linolenic acid)		SGS AXYS MLM-001	MLM-001	Y	
Glyceroxy carnitine		SGS AXYS MLM-001	MLM-001	Y	
Glutamate		SGS AXYS MLM-001	MLM-001	Y	
Glutaryl carnitine (Hydroxyhexanoylcarnitine)		SGS AXYS MLM-001	MLM-001	Y	
Glycine		SGS AXYS MLM-001	MLM-001	Y	
Glycochenodeoxycholic acid		SGS AXYS MLM-001	MLM-001	Y	
Glycocholic acid		SGS AXYS MLM-001	MLM-001	Y	
Glycodeoxycholic acid		SGS AXYS MLM-001	MLM-001	Y	
Hexadecenoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Hexadecanoylethanol acid (palmitic acid)		SGS AXYS MLM-001	MLM-001	Y	
Heptadecenoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Heptadecanoylethanol acid (palmitoleic acid)		SGS AXYS MLM-001	MLM-001	Y	
Heptadecenoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Heptadecenoylcarnitine (fumaryl)carnitine		SGS AXYS MLM-001	MLM-001	Y	
Heptadecenoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Hexose (sum isomers)		SGS AXYS MLM-001	MLM-001	Y	
Histamine		SGS AXYS MLM-001	MLM-001	Y	
Histidine		SGS AXYS MLM-001	MLM-001	Y	
Hydroxyhexadecenoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Hydroxyheptadecenoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Hydroxyhexadecenoylcarnitine C14:1		SGS AXYS MLM-001	MLM-001	Y	
Hydroxysphingomyeline C16:1		SGS AXYS MLM-001	MLM-001	Y	
Hydroxysphingomyeline C22:1		SGS AXYS MLM-001	MLM-001	Y	
Hydroxysphingomyeline C24:1		SGS AXYS MLM-001	MLM-001	Y	
Hydroxysphingomyeline C22:2		SGS AXYS MLM-001	MLM-001	Y	
Hydroxystetradecenoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Hydroxystearoylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Hydroxystearoylcarnitine (Methylmalonylcarnitine)		SGS AXYS MLM-001	MLM-001	Y	
Kynurenone		SGS AXYS MLM-001	MLM-001	Y	
Leucine		SGS AXYS MLM-001	MLM-001	Y	
Lithocholic acid		SGS AXYS MLM-001	MLM-001	Y	
Lysine		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C14:0		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C16:0		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C16:1		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C17:0		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C18:0		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C18:1		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C18:2		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C20:3		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C24:0		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C26:1		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C28:0		SGS AXYS MLM-001	MLM-001	Y	
lysophosphatidylcholine acyl C28:1		SGS AXYS MLM-001	MLM-001	Y	
Methionine		SGS AXYS MLM-001	MLM-001	Y	
Methionylsulfoxide		SGS AXYS MLM-001	MLM-001	Y	
Methylglycylcarnitine		SGS AXYS MLM-001	MLM-001	Y	
Nicotinamide		SGS AXYS MLM-001	MLM-001	Y	
Norvaline		SGS AXYS MLM-001	MLM-001	Y	
Norvalylcarnitine		SGS AXYS MLM-001	MLM-001	Y	

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Serum
	Phosphatidylserine diacyl C4:0:1	SGS AXYS MLA-001	MLA-001	Alaska DEC ANAB DoD ** ANAB ISO 17025	Solids
	Phosphatidylserine diacyl C4:0:2	SGS AXYS MLA-001	MLA-001	CALA	
	Phosphatidylserine diacyl C4:0:3	SGS AXYS MLA-001	MLA-001	California WB	
	Phosphatidylserine diacyl C4:0:4	SGS AXYS MLA-001	MLA-001	Florida DOH	
	Phosphatidylserine diacyl C4:0:5	SGS AXYS MLA-001	MLA-001	Maine DOH	
	Phosphatidylserine diacyl C4:0:6	SGS AXYS MLA-001	MLA-001	Minnesota DOH	
	Phosphatidylserine diacyl C4:2:0	SGS AXYS MLA-001	MLA-001	New Jersey DEP	
	Phosphatidylserine diacyl C4:2:1	SGS AXYS MLA-001	MLA-001	New York DOH	
	Phosphatidylserine diacyl C4:2:2	SGS AXYS MLA-001	MLA-001	Virginia DGS	
	Phosphatidylserine diacyl C4:2:4	SGS AXYS MLA-001	MLA-001	Washington DE	
	Phosphatidylserine diacyl C4:2:5	SGS AXYS MLA-001	MLA-001	ANAB DoD **	Tissue
	Phosphatidylserine diacyl C4:2:6	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Phimeloyamine	SGS AXYS MLA-001	MLA-001	CALA	Urine
	Proline	SGS AXYS MLA-001	MLA-001	CALA	Water
	Propionylcamitine	SGS AXYS MLA-001	MLA-001	Alaska DEC ANAB DoD ** ANAB ISO 17025	Water, Non-Potable
	Propionylcamitine	SGS AXYS MLA-001	MLA-001	ANAB DoD **	AFFF
	Putrescine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Sarcosine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Serine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Serotonin	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Spermidine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Spermine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C16:0	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C16:1	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C18:0	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C18:1	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C20:2	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C22:3	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C24:0	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C24:1	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C26:0	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Springamevine C26:1	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Symmetric dimethylarginine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Taurine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Tauromechanoxylic acid	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Taurotropic acid	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Taurodeoxycholic acid	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Taurolithocholic acid	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Tauromechoxylic acid	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Tetra-acetylmethylamine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Tetradecanoic acid (myrist acid)	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Tetradecenoic camitine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Tetradecenoic camitine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Theanine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Tiglycamidine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Total methylnigamine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Tryptophan	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Tyrosine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Ursodeoxycholic acid	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Valericamidine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Valine	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
TOP					
	Perflurobutanesulfonate (PBBS)	SGS AXYS MLA-111	MLA-111	ANAB ISO 17025	
	Perflurobutanoate (PFBA)	SGS AXYS MLA-111	MLA-111	ANAB ISO 17025	
	Perflurobutanesulfonate (PBDS)	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Perflurodecane (PFDA)	SGS AXYS MLA-111	MLA-111	ANAB ISO 17025	
	Perflurodecaesulfonate (PFDS)	SGS AXYS MLA-001	MLA-001	ANAB ISO 17025	
	Perfluorooctanesulfonate (PFDOA)	SGS AXYS MLA-111	MLA-111	ANAB ISO 17025	
	Perflurooctanesulfonate (PFHs)	SGS AXYS MLA-111	MLA-111	ANAB ISO 17025	
	Perflurooctanoate (PFOA)	SGS AXYS MLA-111	MLA-111	ANAB ISO 17025	
	Perflurooctanoate (PFOS)	SGS AXYS MLA-111	MLA-111	ANAB ISO 17025	
	Perflurooctanoate (PFOS)	SGS AXYS MLA-111	MLA-111	ANAB ISO 17025	
	Perflurooctanoate (PFPe)	SGS AXYS MLA-111	MLA-111	ANAB ISO 17025	
	Perflurooctanoate (PFPeA)	SGS AXYS MLA-111	MLA-111	ANAB ISO 17025	
	Perfluoroundecanoate (PFUnA)	SGS AXYS MLA-111	MLA-111	ANAB ISO 17025	
Note *	Analysis of PFASs in non-potable water samples by SGS AXYS method MLA-007, with the exception of NPDES or State permitted discharges and Stormwater applications, may fall within the scope of Washington State Department of Ecology solids matrix accreditation, subject to approval of the Ecology Project Manager.				

Compound Class	Compound	Note **	Accredited Method ID	SGS AXYS Method ID	
Y	Accreditation scope				
AFFF	Aqueous film forming foam				
BFR	Brominated flame retardants (non-PBDE)				
BPA and mPE	Bisphenol A and mono-Phthalate Esters				
OC Pesticides	Organochlorine Pesticides				
PAH	Polyaromatic Hydrocarbons				
PBDE	Polybrominated diphenyl ethers				
PCB	Polychlorinated Biphenyls				
PCDD/F	Polychlorinated dibenzodioxins/furans				
PFAS	Per- and Polyfluorinated Substances				
PPCP	Pharmaceutical and Personal Care Products				
TOP	Total Oxidizable Precursors				
California WB	California Water Boards, Lab ID 2911				
Florida DOH	Florida Department of Health, Lab ID EB71007, (NELAC Standard)				
Pennsylvania DEP	Pennsylvania Department of Environmental Protection				
Minnesota DOH	Minnesota Department of Health, Lab ID 232-999-4370, (NELAC Standard)				
New Jersey DEP	New Jersey Department of Environmental Protection, Lab ID CAN405, (NELAC Standard)				
New York DOH	New York Department of Health, Lab ID 11674, (NELAC Standard)				
Washington DE	Washington Department of Ecology, Lab ID 460224, (NELAC Standard)				
Virginia DGS	Virginia Department of General Services, Division of Consolidated Laboratory Services, Lab ID 17-014				
Alaska DEC	Alaska Department of Environmental Conservation, Contaminated Sites Laboratory Approval 17-014				
Maine DOH	Maine Center for Disease Control and Prevention, Department of Health and Human Services, Lab ID CN00003				
CALA	Serum				
Alaska DEC	Solids				
ANAB DoD **					
ANAB ISO 17025					
CALA					
California WB					
Florida DOH					
Maine DOH					
Minnesota DOH					
New Jersey DEP					
New York DOH					
Virginia DGS					
Washington DE					
ANAB DoD **	Tissue				
ANAB ISO 17025					
CALA					
Florida DOH					
Minnesota DOH					
New Jersey DEP					
Virginia DGS					
CALA	Urine				
CALA	Water				
Alaska DEC	Water, Non-Potable				
ANAB DoD **					
ANAB ISO 17025					
CaliforniWB					
Florida DOH					
Maine DOH					
Minnesota DOH					
New Jersey DEP					
New York DOH					
Pennsylvania DEP					
Virginia DGS					
Washington DE *					
ANAB DoD **	AFFF				
ANAB ISO 17025					

ANAB DoD

ANSI National Accreditation Board, certificate ADE-1861, (US DoD QSM 5.3 Standard)

CALA

Canadian Association for Laboratory Accreditation Inc., Lab ID A2637, (ISO/IEC 17025:2017 Standard)



Testing
Accreditation No. A2637



2045 Mills Road West

TEL: (250) 655-5800

Sidney, BC, Canada V8L5X2

TOLL-FREE: 1-888-373-0881

SGS AXYS Client No.: 4066

Client Address: Tetra Tech, Inc. - Pacific Guardian Ctr.
 737 Bishop St., Suite 2340, Mauka Tower
 Honolulu, HI, US, 96813-3201

The SGS AXYS contact for these data is Dale Robinson.

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BATCH SUMMARY

Batch ID:	WG72539	Date:	19-Jun-2020
Analysis Type:	Perfluorinated Organic and FTS	Matrix Type:	Aqueous

BATCH MAKEUP

Contract:	4066	Blank:	HDOH-HPU PFAS WG72539-101
Samples:	L33105-1 L33105-2 L33105-3	Fish Field Blank 1 Fish Field Blank 2 Fish Field Blank 3	
			Reference or Spike: WG72539-102

Comments:

1. Data are considered final.
2. For the laboratory procedural blank sample (SGS AXYS ID: WG72539-101), 6:2 FTS was detected above the reporting limit but below the SGS AXYS method limit. The same compound was not detected in any of the field samples. Data are not blank corrected. Blank data should be taken into consideration when evaluating sample data.
3. Blank data should be evaluated against specifications using the same blank sample size as the size of the client samples.

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February 2017



CHAIN OF CUSTODY

2045 Mills Road West TEL: (250) 655-5800 TOLL FREE 1-888-373-0881
 Sidney, British Columbia, Canada V8L 5X2 FAX: (250) 655-5811

SGS AXYS CLIENT #: 4066

REPORT TO:

Company		TO:		ANALYSIS REQUESTED	
Address	Address	Company	Tera Tech, Inc. Honolulu		
41-202 Kālamianole Hwy, Ste 9 Waimanalo, HI 96795	737 Bishop St., Suite 2340 Pacific Guardian Center, Mauka Tower Honolulu, HI 96813-3201				
Contact	Contact	Eric Jensen			
Jennifer Lynch	Eric Jensen				
Phone	Phone	808-441-4784			
FAX	FAX	808-536-3953			
E-mail	E-mail	eric.jensen@tetratech.com			
Project Name/Number: Perfluoroalkyl substance (PFAS) concentrations in fillets of nearshore Hawaiian reef fish caught in subsistence fisheries (HI DOH HPU)	Sampler's Name: Natasha Sawickij Signature:				
Client Sample Identification	Sampling Date	Sampling Time	Container Type/No.	SGS AXYS Lab Sample ID (Lab use only)	MLA-110 (UPLC-MS/MS)
Site 1 Kailua WWTP Fish #1	Matrix	Nov 3 2019	9:20 AM	50 mL PP tube	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 1 Kailua WWTP Fish #2	Homogenized fish muscle	Nov 3 2019	9:38 AM	50 mL PP tube	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 1 Kailua WWTP Fish #3	Homogenized fish muscle	Nov 3 2019	11:25 AM	50 mL PP tube	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 3 Ewa Beach Fish # 1	Homogenized fish muscle	Dec 15 2019	morning	50 mL PP tube	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 3 Ewa Beach Fish # 2	Homogenized fish muscle	Feb 22 2020	morning	50 mL PP tube	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 3 Ewa Beach Fish # 3	Homogenized fish muscle	Mar 21 2020	11:25 AM	50 mL PP tube	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 4 Ala Wai Fish # 1	Homogenized fish muscle	Nov 15 2019	12:28 PM	50 mL PP tube	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 4 Ala Wai Fish # 2	Homogenized fish muscle	Nov 15 2019	12:37 PM	50 mL PP tube	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 4 Ala Wai Fish # 3	Homogenized fish muscle	Nov 15 2019	12:44 PM	50 mL PP tube	MLA-110 (UPLC-MS/MS) Fish Tissue samples

Received by: Jennifer Lynch

20 May 2020

10:35

Site 9 Bellows Fish #1	Homogenized fish muscle	Feb 23 2020	11:30 AM	50 mL PP tube	L33107-10	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 9 Bellows Fish #2	Homogenized fish muscle	Feb 23 2020	11:30 AM	50 mL PP tube	-11	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 9 Bellows Fish #3	Homogenized fish muscle	Mar 22 2020	Morning	50 mL PP tube	-12	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 5 Honolulu Harbor Fish #1	Homogenized fish muscle	Nov 15 2019	2:35 PM	50 mL PP tube	-13	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 5 Honolulu Harbor Fish #2	Homogenized fish muscle	Nov 15 2019	2:40PM	50 mL PP tube	-14	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 5 Honolulu Harbor Fish #3	Homogenized fish muscle	Dec 15 2019	2:40PM	50 mL PP tube	-15	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 7 Pearl Harbor Fish #1	Homogenized fish muscle	Feb 22 2020	1:30 PM	50 mL PP tube	-16	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 7 Pearl Harbor Fish #2	Homogenized fish muscle	Feb 22 2020	1:30 PM	50 mL PP tube	-17	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 7 Pearl Harbor Fish #3	Homogenized fish muscle	Feb 22 2020	2:00 PM	50 mL PP tube	-18	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 6 Ahuimanu Fish #1	Homogenized fish muscle	Mar 12 2020	10:45 AM	50 mL PP tube	-19	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 6 Ahuimanu Fish #2	Homogenized fish muscle	Mar 12 2020	10:55 AM	50 mL PP tube	-20	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 6 Ahuimanu Fish #3	Homogenized fish muscle	Apr 11 2020	10:15 AM	50 mL PP tube	-21	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 10 K South Fish #1	Homogenized fish muscle	Mar 3 2020	2:10 PM	50 mL PP tube	-22	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 10 K South Fish #2	Homogenized fish muscle	Mar 3 2020	2:15 PM	50 mL PP tube	-23	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 10 K South Fish #3	Homogenized fish muscle	Mar 3 2020	2:20 PM	50 mL PP tube	-24	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 8 Hawaii Kai Fish #1	Homogenized fish muscle	Apr 13 2020	9:00 PM	50 mL PP tube	-25	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 8 Hawaii Kai Fish #2	Homogenized fish muscle	Apr 13 2020	9:00 PM	50 mL PP tube	-26	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 8 Hawaii Kai Fish #3	Homogenized fish muscle	Apr 13 2020	9:00 PM	50 mL PP tube	-27	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 12 Marine Corps Far Fish #1	Homogenized fish muscle	Mar 12 2020	12:50 PM	50 mL PP tube	-28	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 12 Marine Corps Far Fish #2	Homogenized fish muscle	Apr 11 2020	9:20 AM	50 mL PP tube	-29	MLA-110 (UPLC-MS/MS) Fish Tissue samples

Received by: Jennifer Carlson 20 May 2020

10:35

Page 4 of 55

Site 12 Marine Corps Far Fish #3	Homogenized fish muscle	Apr 11 2020	9:30 AM	50 mL PP tube	L 33107 - 30	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 11 Landfill Fish #1	Homogenized fish muscle	Mar 3 2020	4:25 PM	50 mL PP tube	- 31	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 11 Landfill Fish #2	Homogenized fish muscle	Apr 29 2020	1:00 PM	50 mL PP tube	- 32	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 11 Landfill Fish #3	Homogenized fish muscle	Apr 29 2020	12:10 PM	50 mL PP tube	- 33	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 13 K North Fish #1	Homogenized fish muscle	May 7 2020	10:40 AM	50 mL PP tube	- 34	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 13 K North Fish #2	Homogenized fish muscle	May 7 2020	10:50 AM	50 mL PP tube	- 35	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 13 K North Fish #3	Homogenized fish muscle	May 7 2020	10:40 AM	50 mL PP tube	- 36	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 14 Kahuku Fish #1	Homogenized fish muscle	May 13 2020	11:07 AM	50 mL PP tube	- 37	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 14 Kahuku Fish #2	Homogenized fish muscle	May 13 2020	12:15 PM	50 mL PP tube	- 38	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 14 Kahuku Fish #3	Homogenized fish muscle	May 13 2020	10:45 AM	50 mL PP tube	- 39	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 15 Haleiwa Fish #1	Homogenized fish muscle	May 7 2020	1:50 PM	50 mL PP tube	- 40	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 15 Haleiwa Fish #2	Homogenized fish muscle	May 7 2020	1:55 PM	50 mL PP tube	- 41	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Site 15 Haleiwa Fish #3	Homogenized fish muscle	May 7 2020	2:00 PM	50 mL PP tube	- 42	MLA-110 (UPLC-MS/MS) Fish Tissue samples
Fish Field Blank 1	Deionized water	Apr 29 2020	morning	50 mL PP tube	L 33105 - 1	MLA-110 (UPLC-MS/MS) Water samples
Fish Field Blank 2	Deionized water	May 7 2020	morning	50 mL PP tube	- 2	MLA-110 (UPLC-MS/MS) Water samples
Fish Field Blank 3	Deionized water	May 13 2020	11:27 AM	50 mL PP tube	- 3	MLA-110 (UPLC-MS/MS) Water samples
Relinquished by (Signature) <i>Jennifer Lynch</i>	Date <u>May 13-2020</u> Time <u>10:35</u>	Received by (Signature) <u>Tonya Andersen</u>	Courier <u>FedEx</u>	Sample Receipt	Wavbill No. <u>see email</u>	
Remarks	Date	Time			Temp °C	Cooler
					Custody Seal #	

SGS AXYS METHOD MLA-110 Rev 02

**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**

CLIENT SAMPLE NO.
Fish Field Blank 1
Sample Collection:
29-Apr-2020 11:59

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix: AQUEOUS

Sample Receipt Date: 20-May-2020

Extraction Date: 10-Jun-2020

Analysis Date: 11-Jun-2020 **Time:** 05:42:10

Extract Volume (uL): 4000

Injection Volume (uL): 2

Dilution Factor: N/A

Concentration Units: ng/L

Project No.

HDOH-HPU PFAS

Lab Sample I.D.:

L33105-1

Sample Size:

0.00907 L

Initial Calibration Date:

18-Mar-2020

Instrument ID:

LCMS/MS

Column ID:

C18

Sample Data Filename:

FC0L_188 S: 19

Blank Data Filename:

FC0L_188 S: 18

Cal. Ver. Data Filename:

FC0L_188 S: 12

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		176 (L)	
PFPeA	U		88.2 (L)	
PFHxA	U		44.1 (L)	
PFHpA	U		44.1 (L)	
PFOA	U		44.1 (L)	
PFNA	U		44.1 (L)	
PFDA	U		44.1 (L)	
PFUnA	U		44.1 (L)	
PFDoA	U		44.1 (L)	
PFTrDA	U		44.1 (L)	
PFTeDA	U		44.1 (L)	
PFBS	U		44.1 (L)	
PFPeS	U		44.1 (L)	
PFHxS	U		44.1 (L)	
PFHpS	U		44.1 (L)	
PFOS	U		44.1 (L)	
PFNS	U		44.1 (L)	
PFDS	U		44.1 (L)	
PFDoS	U		44.1 (L)	
4:2 FTS	U		176 (L)	
6:2 FTS	U		159 (L)	
8:2 FTS	U		176 (L)	
PFOSA	U		44.1 (L)	
N-MeFOSA	U		50.7 (L)	
N-EtFOSA	U		110 (L)	
MeFOSAA	U		44.1 (L)	
EtFOSAA	U		44.1 (L)	
N-MeFOSE	U		441 (L)	
N-EtFOSE	U		331 (L)	
HFPO-DA	U		168 (L)	
ADONA	U		176 (L)	
9CI-PF3ONS	U		176 (L)	
11CI-PF3OUDS	U		176 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Fish Field Blank 1
Sample Collection:
29-Apr-2020 11:59

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix: AQUEOUS

Sample Receipt Date: 20-May-2020

Extraction Date: 10-Jun-2020

Analysis Date: 11-Jun-2020 **Time:** 05:42:10

Extract Volume (uL): 4000

Injection Volume (uL): 2

Dilution Factor: N/A

Concentration Units: ng absolute

Project No.

HDOH-HPU PFAS

Lab Sample I.D.:

L33105-1

Sample Size:

0.00907 L

Initial Calibration Date:

18-Mar-2020

Instrument ID:

LCMS/MS

Column ID:

C18

Sample Data Filename:

FC0L_188 S: 19

Blank Data Filename:

FC0L_188 S: 18

Cal. Ver. Data Filename:

FC0L_188 S: 12

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LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	35.6	89.0	1:51
13C5-PFPeA		20.0	19.9	99.6	4:21
13C5-PFHxA		10.0	9.72	97.2	4:57
13C4-PFHxA		10.0	9.53	95.3	5:24
13C8-PFOA		10.0	8.86	88.6	6:09
13C9-PFNA		5.00	4.34	86.8	6:59
13C6-PFDA		5.00	4.87	97.5	7:30
13C7-PFUuA		5.00	4.53	90.5	7:49
13C2-PFDuA		5.00	4.19	83.8	8:05
13C2-PFTeDA		5.00	4.13	82.5	8:49
13C3-PFBS		10.0	10.1	101	4:54
13C3-PFHxS		10.0	8.95	89.5	6:15
13C8-PFOS		10.0	9.77	97.7	7:35
13C2-4:2 FTS		20.0	19.9	99.3	4:49
13C2-6:2 FTS		20.0	17.9	89.4	5:50
13C2-8:2 FTS		20.0	19.8	99.2	7:20
13C8-PFOSA		10.0	8.95	89.5	8:41
D3-N-MeFOSA		10.0	8.32	83.2	10:07
D5-N-EtFOSA		10.0	8.50	85.0	10:24
D3-MeFOSAA		20.0	18.4	92.2	7:33
D5-EtFOSAA		20.0	17.1	85.6	7:41
d7-NMe-FOSE		100	90.7	90.7	9:59
d9-NEt-FOSE		100	93.4	93.4	10:17
13C3-HFPO-DA		40.0	38.7	96.6	5:05

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

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Report Filename: PFC_FC_LC_PFAS_L33105-1_Form2_FC0L_188S19_SJ2752961.html; Workgroup: WG72539; Design ID: 3989]

SGS AXYS METHOD MLA-110 Rev 02

**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**

CLIENT SAMPLE NO.
Fish Field Blank 2
Sample Collection:
07-May-2020 11:59

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix: AQUEOUS

Sample Receipt Date: 20-May-2020

Extraction Date: 10-Jun-2020

Analysis Date: 11-Jun-2020 **Time:** 05:55:08

Extract Volume (uL): 4000

Injection Volume (uL): 2

Dilution Factor: N/A

Concentration Units: ng/L

Project No.

HDOH-HPU PFAS

Lab Sample I.D.:

L33105-2

Sample Size:

0.00836 L

Initial Calibration Date:

18-Mar-2020

Instrument ID:

LCMS/MS

Column ID:

C18

Sample Data Filename:

FC0L_188 S: 20

Blank Data Filename:

FC0L_188 S: 18

Cal. Ver. Data Filename:

FC0L_188 S: 12

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		191 (L)	
PFPeA	U		95.7 (L)	
PFHxA	U		47.8 (L)	
PFHpA	U		47.8 (L)	
PFOA	U		47.8 (L)	
PFNA	U		47.8 (L)	
PFDA	U		47.8 (L)	
PFUnA	U		47.8 (L)	
PFDoA	U		47.8 (L)	
PFTrDA	U		47.8 (L)	
PFTeDA	U		47.8 (L)	
PFBS	U		47.8 (L)	
PFPeS	U		47.8 (L)	
PFHxS	U		47.8 (L)	
PFHpS	U		47.8 (L)	
PFOS	U		47.8 (L)	
PFNS	U		47.8 (L)	
PFDS	U		47.8 (L)	
PFDoS	U		47.8 (L)	
4:2 FTS	U		191 (L)	
6:2 FTS	U		172 (L)	
8:2 FTS	U		191 (L)	
PFOSA	U		47.8 (L)	
N-MeFOSA	U		55.0 (L)	
N-EtFOSA	U		120 (L)	
MeFOSAA	U		47.8 (L)	
EtFOSAA	U		47.8 (L)	
N-MeFOSE	U		478 (L)	
N-EtFOSE	U		359 (L)	
HFPO-DA	U		182 (L)	
ADONA	U		191 (L)	
9CI-PF3ONS	U		191 (L)	
11CI-PF3OUDS	U		191 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Fish Field Blank 2
Sample Collection:
07-May-2020 11:59

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix: AQUEOUS

Sample Receipt Date: 20-May-2020

Extraction Date: 10-Jun-2020

Analysis Date: 11-Jun-2020 **Time:** 05:55:08

Extract Volume (uL): 4000

Injection Volume (uL): 2

Dilution Factor: N/A

Concentration Units: ng absolute

Project No.

HDOH-HPU PFAS

Lab Sample I.D.:

L33105-2

Sample Size:

0.00836 L

Initial Calibration Date:

18-Mar-2020

Instrument ID:

LCMS/MS

Column ID:

C18

Sample Data Filename:

FC0L_188 S: 20

Blank Data Filename:

FC0L_188 S: 18

Cal. Ver. Data Filename:

FC0L_188 S: 12

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	36.2	90.5	1:51
13C5-PFPeA		20.0	19.7	98.7	4:21
13C5-PFHxA		10.0	9.83	98.3	4:57
13C4-PFHxA		10.0	10.1	101	5:24
13C8-PFOA		10.0	9.35	93.5	6:09
13C9-PFNA		5.00	4.58	91.6	6:59
13C6-PFDA		5.00	4.74	94.8	7:30
13C7-PFUuA		5.00	4.68	93.6	7:49
13C2-PFDuA		5.00	4.46	89.1	8:05
13C2-PFTeDA		5.00	4.11	82.3	8:49
13C3-PFBS		10.0	10.3	103	4:54
13C3-PFHxA		10.0	9.20	92.0	6:15
13C8-PFOS		10.0	9.93	99.3	7:35
13C2-4:2 FTS		20.0	19.4	97.2	4:50
13C2-6:2 FTS		20.0	18.0	89.9	5:50
13C2-8:2 FTS		20.0	19.9	99.7	7:20
13C8-PFOSA		10.0	9.18	91.8	8:41
D3-N-MeFOSA		10.0	8.67	86.7	10:07
D5-N-EtFOSA		10.0	8.38	83.8	10:24
D3-MeFOSAA		20.0	18.6	92.8	7:33
D5-EtFOSAA		20.0	17.5	87.6	7:41
d7-NMe-FOSE		100	91.8	91.8	9:59
d9-NEt-FOSE		100	93.8	93.8	10:17
13C3-HFPO-DA		40.0	39.8	99.5	5:05

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 19-Jun-2020 12:17:30; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33105-2_Form2_FC0L_188S20_SJ2752962.html; Workgroup: WG72539; Design ID: 3989]

SGS AXYS METHOD MLA-110 Rev 02

**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**

CLIENT SAMPLE NO.
Fish Field Blank 3
Sample Collection:
13-May-2020 11:27

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Project No.

HDOH-HPU PFAS

Lab Sample I.D.:

L33105-3

Matrix: AQUEOUS

Sample Size:

0.00842 L

Sample Receipt Date: 20-May-2020

Initial Calibration Date:

18-Mar-2020

Extraction Date: 10-Jun-2020

Instrument ID:

LCMS/MS

Analysis Date: 11-Jun-2020 **Time:** 06:08:13

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC0L_188 S: 21

Injection Volume (uL): 2

Blank Data Filename:

FC0L_188 S: 18

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC0L_188 S: 12

Concentration Units: ng/L

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		190 (L)	
PFPeA	U		95.0 (L)	
PFHxA	U		47.5 (L)	
PFHpA	U		47.5 (L)	
PFOA	U		47.5 (L)	
PFNA	U		47.5 (L)	
PFDA	U		47.5 (L)	
PFUnA	U		47.5 (L)	
PFDoA	U		47.5 (L)	
PFTrDA	U		47.5 (L)	
PFTeDA	U		47.5 (L)	
PFBS	U		47.5 (L)	
PFPeS	U		47.5 (L)	
PFHxS	U		47.5 (L)	
PFHpS	U		47.5 (L)	
PFOS	U		47.5 (L)	
PFNS	U		47.5 (L)	
PFDS	U		47.5 (L)	
PFDoS	U		47.5 (L)	
4:2 FTS	U		190 (L)	
6:2 FTS	U		171 (L)	
8:2 FTS	U		190 (L)	
PFOSA	U		47.5 (L)	
N-MeFOSA	U		54.6 (L)	
N-EtFOSA	U		119 (L)	
MeFOSAA	U		47.5 (L)	
EtFOSAA	U		47.5 (L)	
N-MeFOSE	U		475 (L)	
N-EtFOSE	U		356 (L)	
HFPO-DA	U		181 (L)	
ADONA	U		190 (L)	
9CI-PF3ONS	U		190 (L)	
11CI-PF3OUDS	U		190 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Fish Field Blank 3
Sample Collection:
13-May-2020 11:27

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix: AQUEOUS

Sample Receipt Date: 20-May-2020

Extraction Date: 10-Jun-2020

Analysis Date: 11-Jun-2020 **Time:** 06:08:13

Extract Volume (uL): 4000

Injection Volume (uL): 2

Dilution Factor: N/A

Concentration Units: ng absolute

Project No.

HDOH-HPU PFAS

Lab Sample I.D.:

L33105-3

Sample Size:

0.00842 L

Initial Calibration Date:

18-Mar-2020

Instrument ID:

LCMS/MS

Column ID:

C18

Sample Data Filename:

FC0L_188 S: 21

Blank Data Filename:

FC0L_188 S: 18

Cal. Ver. Data Filename:

FC0L_188 S: 12

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	36.8	92.1	1:51
13C5-PFPeA		20.0	20.3	101	4:21
13C5-PFHxA		10.0	10.3	103	4:57
13C4-PFHxA		10.0	9.89	98.9	5:24
13C8-PFOA		10.0	9.12	91.2	6:09
13C9-PFNA		5.00	4.79	95.8	7:00
13C6-PFDA		5.00	4.62	92.5	7:30
13C7-PFUuA		5.00	4.53	90.7	7:49
13C2-PFDuA		5.00	4.50	90.0	8:05
13C2-PFTeDA		5.00	4.00	80.0	8:49
13C3-PFBS		10.0	9.76	97.6	4:54
13C3-PFHxS		10.0	9.29	92.9	6:15
13C8-PFOS		10.0	10.4	104	7:36
13C2-4:2 FTS		20.0	19.3	96.4	4:50
13C2-6:2 FTS		20.0	18.0	89.9	5:50
13C2-8:2 FTS		20.0	20.5	102	7:20
13C8-PFOSA		10.0	9.60	96.0	8:41
D3-N-MeFOSA		10.0	8.93	89.3	10:07
D5-N-EtFOSA		10.0	9.58	95.8	10:24
D3-MeFOSAA		20.0	18.6	92.8	7:33
D5-EtFOSAA		20.0	19.6	98.1	7:41
d7-NMe-FOSE		100	96.9	96.9	9:59
d9-NEt-FOSE		100	98.5	98.5	10:17
13C3-HFPO-DA		40.0	39.9	99.8	5:05

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 19-Jun-2020 12:17:30; Application: XMLTransformer-1.18.8;
Report Filename: PFC_FC_LC_PFAS_L33105-3_Form2_FC0L_188S21_SJ2752963.html; Workgroup: WG72539; Design ID: 3989]

SGS AXYS METHOD MLA-110 Rev 02

**Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT**

CLIENT SAMPLE NO.**Lab Blank****Sample Collection:****N/A****SGS AXYS ANALYTICAL SERVICES**

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066**Project No.****N/A****Lab Sample I.D.:**

WG72539-101 :4066

Matrix: AQUEOUS**Sample Size:**

0.0100 L

Sample Receipt Date: N/A**Initial Calibration Date:**

18-Mar-2020

Extraction Date: 10-Jun-2020**Instrument ID:**

LCMS/MS

Analysis Date: 11-Jun-2020 **Time:** 05:29:05**Column ID:**

C18

Extract Volume (uL): 4000**Sample Data Filename:**

FC0L_188 S: 18

Injection Volume (uL): 2**Blank Data Filename:**

FC0L_188 S: 18

Dilution Factor: N/A**Cal. Ver. Data Filename:**

FC0L_188 S: 12

Concentration Units: ng/L

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG¹	CONC. FOUND	REPORTING LIMIT (RL)²	RETENTION TIME
PFBA	U		160 (L)	
PFPeA	U		80.0 (L)	
PFHxA	U		40.0 (L)	
PFHpA	U		40.0 (L)	
PFOA	U		40.0 (L)	
PFNA	U		40.0 (L)	
PFDA	U		40.0 (L)	
PFUnA	U		40.0 (L)	
PFDoA	U		40.0 (L)	
PFTrDA	U		40.0 (L)	
PFTeDA	U		40.0 (L)	
PFBS	U		40.0 (L)	
PFPeS	U		40.0 (L)	
PFHxS	U		40.0 (L)	
PFHpS	U		40.0 (L)	
PFOS	U		40.0 (L)	
PFNS	U		40.0 (L)	
PFDS	U		40.0 (L)	
PFDoS	U		40.0 (L)	
4:2 FTS	U		160 (L)	
6:2 FTS	J	213	144 (L)	5:50
8:2 FTS	U		160 (L)	
PFOSA	U		40.0 (L)	
N-MeFOSA	U		46.0 (L)	
N-EtFOSA	U		100 (L)	
MeFOSAA	U		40.0 (L)	
EtFOSAA	U		40.0 (L)	
N-MeFOSE	U		400 (L)	
N-EtFOSE	U		300 (L)	
HFPO-DA	U		152 (L)	
ADONA	U		160 (L)	
9CI-PF3ONS	U		160 (L)	
11CI-PF3OUDS	U		160 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; J = concentration less than limit of quantification.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

SGS AXYS METHOD MLA-110 Rev 02

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Lab Blank
Sample Collection:
N/A

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Matrix: AQUEOUS

Sample Receipt Date: N/A

Extraction Date: 10-Jun-2020

Analysis Date: 11-Jun-2020 **Time:** 05:29:05

Extract Volume (uL): 4000

Injection Volume (uL): 2

Dilution Factor: N/A

Concentration Units: ng absolute

Project No.

N/A

Lab Sample I.D.:

WG72539-101 :4066

Sample Size:

0.0100 L

Initial Calibration Date:

18-Mar-2020

Instrument ID:

LCMS/MS

Column ID:

C18

Sample Data Filename:

FC0L_188 S: 18

Blank Data Filename:

FC0L_188 S: 18

Cal. Ver. Data Filename:

FC0L_188 S: 12

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	36.9	92.2	1:51
13C5-PFPeA		20.0	20.2	101	4:21
13C5-PFHxA		10.0	10.0	100	4:57
13C4-PFHxA		10.0	9.77	97.7	5:24
13C8-PFOA		10.0	9.36	93.6	6:09
13C9-PFNA		5.00	4.54	90.9	7:00
13C6-PFDA		5.00	5.08	102	7:30
13C7-PFUuA		5.00	4.75	94.9	7:50
13C2-PFDuA		5.00	3.50	69.9	8:05
13C2-PFTeDA		5.00	3.97	79.3	8:50
13C3-PFBS		10.0	9.96	99.6	4:54
13C3-PFHxA		10.0	9.22	92.2	6:15
13C8-PFOS		10.0	10.1	101	7:36
13C2-4:2 FTS		20.0	19.2	96.0	4:50
13C2-6:2 FTS		20.0	17.4	87.0	5:51
13C2-8:2 FTS		20.0	19.9	99.5	7:20
13C8-PFOSA		10.0	9.26	92.6	8:41
D3-N-MeFOSA		10.0	7.98	79.8	10:07
D5-N-EtFOSA		10.0	7.79	77.9	10:24
D3-MeFOSAA		20.0	19.6	98.1	7:33
D5-EtFOSAA		20.0	18.3	91.6	7:41
d7-NMe-FOSE		100	89.6	89.6	9:59
d9-NEt-FOSE		100	90.4	90.4	10:17
13C3-HFPO-DA		40.0	39.1	97.8	5:06

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

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Report Filename: PFC_FC_LC_PFAS_WG72539-101_Form2_FC0L_188S18_SJ2752958.html; Workgroup: WG72539; Design ID: 3989]

SGS AXYS METHOD MLA-110 Rev 02

Form 8A

PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4066	Lab Sample I.D.:	WG72539-102 :4066
Matrix:	AQUEOUS	Initial Calibration Date:	18-Mar-2020
Extraction Date:	10-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	11-Jun-2020 Time: 05:03:03	Column ID:	C18
Extract Volume (uL):	4000	OPR Data Filename:	FC0L_188 S: 16
Injection Volume (uL):	2	Blank Data Filename:	FC0L_188 S: 18
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_188 S: 12

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

COMPOUND	LAB FLAG ¹	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
PFBA		40.0	38.6	96.4	1:52
PFPeA		20.0	19.2	96.2	4:21
PFHxA		10.0	9.40	94.0	4:57
PFHpA		10.0	9.43	94.3	5:24
PFOA		10.0	9.13	91.3	
PFNA		10.0	9.75	97.5	
PFDA		10.0	8.99	89.9	7:30
PFUnA		10.0	9.26	92.6	7:49
PFDoA		10.0	12.7	127	8:05
PFTrDA		10.0	10.6	106	8:25
PFTeDA		10.0	9.99	99.9	8:50
PFBS		10.0	9.52	95.2	4:54
PFPeS		10.0	10.5	105	5:26
PFHxS		10.0	9.63	96.3	
PFHpS		10.0	9.41	94.1	7:06
PFOS		10.0	8.50	85.0	
PFNS		10.0	7.58	75.8	7:55
PFDS		10.0	9.10	91.0	8:12
PFDoS		10.0	8.50	85.0	9:00
4:2 FTS		40.0	43.1	108	4:50
6:2 FTS		36.1	33.9	93.9	5:50
8:2 FTS		40.0	35.2	87.9	7:20
PFOSA		10.0	9.67	96.7	
N-MeFOSA		11.5	11.8	103	
N-EtFOSA		25.0	22.2	88.8	
MeFOSAA		10.0	10.2	102	
EtFOSAA		10.0	9.27	92.7	
N-MeFOSE		100	99.2	99.2	
N-EtFOSE		75.0	73.0	97.4	
HFPO-DA		38.0	38.1	100	5:06
ADONA		40.0	38.9	97.3	5:38
9CI-PF3ONS		40.0	37.8	94.5	7:49
11CI-PF3OUdS		40.0	36.4	91.0	8:26

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

SGS AXYS METHOD MLA-110 Rev 02

Form 8B

PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4066	Lab Sample I.D.:	WG72539-102 :4066
Matrix:	AQUEOUS	Initial Calibration Date:	18-Mar-2020
Extraction Date:	10-Jun-2020	Instrument ID:	LCMS/MS
Analysis Date:	11-Jun-2020 Time: 05:03:03	Column ID:	C18
Extract Volume (uL):	4000	OPR Data Filename:	FC0L_188 S: 16
Injection Volume (uL):	2	Blank Data Filename:	FC0L_188 S: 18
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC0L_188 S: 12

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
13C4-PFBA		40.0	36.5	91.3	1:51
13C5-PFPeA		20.0	19.5	97.7	4:21
13C5-PFHxA		10.0	9.53	95.3	4:57
13C4-PFHpA		10.0	9.68	96.8	5:24
13C8-PFOA		10.0	9.06	90.6	6:09
13C9-PFNA		5.00	4.63	92.6	7:00
13C6-PFDA		5.00	4.97	99.3	7:30
13C7-PFUnA		5.00	4.57	91.3	7:50
13C2-PFDmA		5.00	3.47	69.5	8:05
13C2-PFTeDA		5.00	4.05	81.0	8:49
13C3-PFBs		10.0	10.2	102	4:54
13C3-PFHxS		10.0	9.08	90.8	6:15
13C8-PFOS		10.0	10.0	100	7:36
13C2-4:2 FTS		20.0	17.3	86.5	4:50
13C2-6:2 FTS		20.0	16.8	84.2	5:50
13C2-8:2 FTS		20.0	19.5	97.3	7:20
13C8-PFOSA		10.0	9.12	91.2	8:41
D3-N-MeFOSA		10.0	7.60	76.0	10:07
D5-N-EtFOSA		10.0	7.96	79.6	10:24
D3-MeFOSAA		20.0	17.6	88.2	7:33
D5-EtFOSAA		20.0	17.7	88.4	7:41
d7-NMe-FOSE		100	88.0	88.0	9:59
d9-NEt-FOSE		100	94.6	94.6	10:17
13C3-HFPO-DA		40.0	37.7	94.4	5:06

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

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Report Filename: PFC_FC_LC_PFAS_WG72539-102_Form8B_SJ2752955.html; Workgroup: WG72539; Design ID: 3989]

SGS AXYS METHOD MLA-110 Rev 02

Form 3A
LC MS/MS INITIAL CALIBRATION PERCENT RECOVERIES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC0L_082 S: 10

CS2 Data Filename: FC0L_082 S: 11

CS3 Data Filename: FC0L_082 S: 12

CS4 Data Filename: FC0L_082 S: 13

CS5 Data Filename: FC0L_082 S: 14

CS6 Data Filename: FC0L_082 S: 15

CS7 Data Filename: FC0L_082 S: 16

CS8 Data Filename: N/A

COMPOUND	LAB FLAG ¹	PERCENT RECOVERY (%)								
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
PFBA		105	104	101	99.8	94.2	96.1	100		
PFPeA		102	105	100	101	94.3	97.4	100		
PFHxA		112	108	101	98.0	88.5	94.8	97.3		
PFHpA		115	110	97.6	92.5	92.6	96.9	95.4		
PFOA		118	111	103	91.3	86.1	95.5	94.8		
PFNA		105	98.7	97.9	105	90.6	98.1	105		
PFDA		103	112	99.4	96.1	93.4	91.8	104		
PFUnA		99.9	99.9	102	103	96.3	102	97.3		
PFDoA		100	97.1	88.5	125	102	104	83.9		
PFTrDA		94.2	106	103	114	95.7	87.5			
PFTeDA		119	111	106	105	95.9	87.9	74.8		
PFBS		102	108	101	103	94.0	93.8	98.1		
PFPeS		102	106	101	105	97.1	97.7	90.3		
PFHxS		101	103	101	97.2	91.2	97.3	109		
PFHpS		100	114	101	99.9	90.6	95.7	98.7		
PFOS		119	115	91.5	93.3	89.6	91.4	101		
PFNS		114	129	76.4	83.2	81.8	107	108		
PFDS		112	118	93.5	94.2	91.1	90.4	101		
PFDoS		99.1	117	97.2	99.1	91.9	93.7	102		
4:2 FTS		114	101	102	111	99.9	95.9	76.0		
6:2 FTS		110	117	98.7	100	91.5	82.6			
8:2 FTS		94.7	117	102	100	100	85.4			
PFOSA		109	103	96.9	98.6	94.3	96.3	102		
N-MeFOSA		92.0	116	108	109	98.9	96.2	80.2		
N-EtFOSA		96.6	112	99.7	97.5	95.4	97.1	102		
MeFOSAA		98.3	104	97.0	110	97.2	102	91.0		
EtFOSAA		121	80.0	110	102	93.5	91.3	102		
N-MeFOSE		107	106	103	101	94.2	95.5	93.8		
N-EtFOSE		101	105	107	102	95.3	96.9	93.0		
HFPO-DA		104	104	105	106	99.2	95.5	86.5		
ADONA		104	98.2	99.7	102	99.3	95.9	101		
9CI-PF3ONS		105	111	104	107	97.3	90.9	84.9		
11CI-PF3OUdS		106	109	101	98.1	94.7	94.3	96.9		

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

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Report Filename: PFOA_FC_LC_18-Mar-2020_FC0L__Form3A_GS87754.html; Workgroup: WG72539; Design ID: 3989]

SGS AXYS METHOD MLA-110 Rev 02

Form 3B
LC MS/MS INITIAL CALIBRATION PERCENT RECOVERIES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC0L_082 S: 10

CS2 Data Filename: FC0L_082 S: 11

CS3 Data Filename: FC0L_082 S: 12

CS4 Data Filename: FC0L_082 S: 13

CS5 Data Filename: FC0L_082 S: 14

CS6 Data Filename: FC0L_082 S: 15

CS7 Data Filename: FC0L_082 S: 16

CS8 Data Filename: N/A

LABELED COMPOUND	LAB FLAG ¹	PERCENT RECOVERIES (%)							
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7
13C4-PFBA		99.0	102	99.9	99.7	100	99.5	99.1	
13C5-PFPeA		108	106	104	105	103	94.5	79.2	
13C5-PFHxA		102	103	99.3	101	102	99.2	94.1	
13C4-PFHxA		95.2	106	105	106	106	94.9	86.8	
13C8-PFOA		97.0	101	103	101	106	95.5	95.7	
13C9-PFNA		97.7	105	104	99.3	97.3	102	95.1	
13C6-PFDA		114	108	82.8	113	106	98.3	77.0	
13C7-PFUnA		114	118	103	103	93.3	67.7		
13C2-PFDoA		111	111	96.0	85.8	98.6	94.8	103	
13C2-PFTeDA		97.0	102	95.6	94.2	94.1	99.3	118	
13C3-PFBS		97.7	112	105	102	101	99.2	82.6	
13C3-PFHxS		101	104	102	99.9	101	101	91.4	
13C8-PFOS		99.7	88.7	104	104	100	105	98.6	
13C2-4:2 FTS		105	116	109	96.6	73.2			
13C2-6:2 FTS		105	116	115	106	88.3	70.0		
13C2-8:2 FTS		111	116	116	114	85.5	71.7	85.6	
13C8-PFOSA		92.4	95.4	90.5	92.6	90.8	104	134	
D3-N-MeFOSA		97.8	101	88.3	95.5	100	118		
D5-N-EtFOSA		97.3	96.0	91.1	95.6	90.7	107	122	
D3-MeFOSAA		96.2	92.6	97.5	93.6	95.9	103	121	
D5-EtFOSAA		97.5	100	93.2	97.7	96.2	109	106	
d7-NMe-FOSE		95.8	95.8	89.7	96.2	95.8	107	120	
d9-NEt-FOSE		95.6	98.2	88.6	95.4	93.9	105	124	
13C3-HFPO-DA		109	110	110	107	101	90.0	72.7	

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

For Axys Internal Use Only [XSL Template: FC-Form3B.xsl; Created: 19-Jun-2020 12:17:30; Application: XMLTransformer-1.18.8;
Report Filename: PFOA_FC_LC_18-Mar-2020_FC0L__Form3B_GS87754.html; Workgroup: WG72539; Design ID: 3989]

SGS AXYS METHOD MLA-110 Rev 02

Form 3C
LC MS/MS INITIAL CALIBRATION RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC0L_082 S: 10

CS2 Data Filename: FC0L_082 S: 11

CS3 Data Filename: FC0L_082 S: 12

CS4 Data Filename: FC0L_082 S: 13

CS5 Data Filename: FC0L_082 S: 14

CS6 Data Filename: FC0L_082 S: 15

CS7 Data Filename: FC0L_082 S: 16

CS8 Data Filename: N/A

COMPOUND	LAB FLAG ¹	RETENTION TIMES								MEAN RT
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	
PFBA		1:58	1:58	1:58	1:58	1:58	1:58	1:58	1:58	1:58
PFPeA		4:19	4:19	4:19	4:19	4:19	4:19	4:19	4:19	4:19
PFHxA		4:54	4:54	4:53	4:53	4:54	4:54	4:54	4:54	4:54
PFHpA		5:23	5:23	5:23	5:23	5:23	5:23	5:23	5:23	5:23
PFOA		6:11	6:11	6:11	6:11	6:11	6:11	6:11	6:11	6:11
PFNA		7:02	7:03	7:02	7:03	7:02	7:02	7:02	7:02	7:02
PFDA		7:34	7:34	7:33	7:34	7:33	7:34	7:33	7:34	7:34
PFUnA		7:54	7:54	7:53	7:54	7:54	7:54	7:54	7:54	7:54
PFDoA		8:10	8:10	8:10	8:10	8:10	8:10	8:10	8:10	8:10
PFTrDA		8:30	8:30	8:29	8:29	8:30	8:30	8:30	8:30	8:30
PFTeDA		8:55	8:55	8:55	8:55	8:55	8:55	8:55	8:55	8:55
PFBS		4:51	4:51	4:51	4:51	4:51	4:51	4:51	4:51	4:51
PFPeS		5:25	5:26	5:25	5:25	5:25	5:25	5:26	5:26	5:25
PFHxS		6:17	6:17	6:17	6:17	6:17	6:17	6:17	6:17	6:17
PFHpS		7:09	7:09	7:09	7:09	7:09	7:09	7:09	7:09	7:09
PFOS		7:40	7:40	7:39	7:40	7:39	7:40	7:39	7:40	7:40
PFNS		7:59	7:59	7:59	7:59	7:59	7:59	7:59	7:59	7:59
PFDS		8:16	8:16	8:16	8:16	8:16	8:16	8:16	8:16	8:16
PFDoS		9:06	9:06	9:06	9:06	9:06	9:06	9:06	9:06	9:06
4:2 FTS		4:46	4:46	4:46	4:46	4:46	4:46	4:46	4:46	4:46
6:2 FTS		5:51	5:51	5:51	5:51	5:51	5:51	5:51	5:51	5:51
8:2 FTS		7:24	7:23	7:23	7:23	7:23	7:23	7:23	7:23	7:23
PFOSA		8:45	8:45	8:45	8:45	8:45	8:45	8:45	8:45	8:45
N-MeFOSA		10:12	10:12	10:12	10:12	10:12	10:12	10:12	10:12	10:12
N-EtFOSA		10:30	10:30	10:31	10:30	10:30	10:30	10:30	10:30	10:30
MeFOSAA		7:37	7:37	7:37	7:37	7:37	7:37	7:37	7:37	7:37
EtFOSAA		7:46	7:46	7:45	7:46	7:45	7:46	7:45	7:46	7:46
N-MeFOSE		10:04	10:03	10:04	10:04	10:04	10:04	10:04	10:04	10:04
N-EtFOSE		10:23	10:23	10:23	10:23	10:23	10:23	10:23	10:23	10:23
HFPO-DA		5:03	5:03	5:03	5:03	5:03	5:03	5:03	5:03	5:03
ADONA		5:38	5:38	5:38	5:38	5:38	5:38	5:38	5:38	5:38
9CI-PF3ONS		7:54	7:54	7:53	7:53	7:53	7:54	7:53	7:53	7:53
11CI-PF3OUdS		8:31	8:31	8:31	8:31	8:31	8:31	8:31	8:31	8:31

(1) Where applicable, custom lab flags have been used on this report.

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Report Filename: PFOA_FC_LC_18-Mar-2020_FC0L_Form3C_GS87754.html; Workgroup: WG72539; Design ID: 3989]



SGS AXYS METHOD MLA-110 Rev 02

Form 3D
LC MS/MS INITIAL CALIBRATION RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC0L_082 S: 10

CS2 Data Filename: FC0L_082 S: 11

CS3 Data Filename: FC0L_082 S: 12

CS4 Data Filename: FC0L_082 S: 13

CS5 Data Filename: FC0L_082 S: 14

CS6 Data Filename: FC0L_082 S: 15

CS7 Data Filename: FC0L_082 S: 16

CS8 Data Filename: N/A

LAB FLAG ¹	RETENTION TIMES								MEAN RT
	CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
LABELED COMPOUND									
13C4-PFBA	1:57	1:57	1:57	1:57	1:57	1:57	1:57	1:57	1:57
13C5-PFPeA	4:18	4:19	4:18	4:18	4:19	4:19	4:19	4:19	4:19
13C5-PFHxA	4:53	4:53	4:53	4:53	4:53	4:54	4:54	4:53	4:53
13C4-PFHpA	5:23	5:23	5:23	5:23	5:23	5:23	5:23	5:23	5:23
13C8-PFOA	6:11	6:11	6:11	6:11	6:11	6:11	6:11	6:11	6:11
13C9-PFNA	7:02	7:02	7:02	7:02	7:02	7:02	7:02	7:02	7:02
13C6-PFDA	7:34	7:34	7:33	7:34	7:33	7:33	7:33	7:33	7:33
13C7-PFUnA	7:54	7:54	7:53	7:54	7:53	7:54	7:54	7:54	7:54
13C2-PFDaA	8:10	8:10	8:10	8:10	8:10	8:10	8:10	8:10	8:10
13C2-PFTeDA	8:55	8:55	8:55	8:55	8:55	8:55	8:55	8:55	8:55
13C3-PFBS	4:51	4:51	4:51	4:51	4:51	4:51	4:51	4:51	4:51
13C3-PFHxS	6:17	6:17	6:17	6:17	6:17	6:17	6:17	6:17	6:17
13C8-PFOS	7:40	7:40	7:39	7:40	7:39	7:40	7:39	7:40	7:40
13C2-4:2 FTS	4:46	4:46	4:46	4:46	4:46	4:46			4:46
13C2-6:2 FTS	5:51	5:51	5:51	5:51	5:51	5:51			5:51
13C2-8:2 FTS	7:23	7:24	7:23	7:23	7:23	7:23			7:23
13C8-PFOSA	8:45	8:45	8:45	8:45	8:45	8:45			8:45
D3-N-MeFOSA	10:11	10:11	10:12	10:11	10:12	10:11			10:11
D5-N-EtFOSA	10:30	10:30	10:30	10:30	10:30	10:30			10:30
D3-MeFOSAA	7:37	7:37	7:37	7:37	7:37	7:37			7:37
D5-EtFOSAA	7:45	7:45	7:45	7:45	7:45	7:45			7:45
d7-NMe-FOSE	10:03	10:02	10:03	10:03	10:03	10:03			10:03
d9-NEt-FOSE	10:22	10:22	10:22	10:22	10:22	10:22			10:22
13C3-HFPO-DA	5:03	5:03	5:03	5:03	5:03	5:03			5:03

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

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Report Filename: PFOA_FC_LC_18-Mar-2020_FC0L_Form3D_GS87754.html; Workgroup: WG72539; Design ID: 3989]

SGS AXYS METHOD MLA-110 Rev 02

Form 4A
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date:	18-Mar-2020	VER Data Filename:	FC0L_188 S: 12
Instrument ID:	LCMS/MS	Analysis Date:	11-Jun-2020
LC Column ID:	C18	Analysis Time:	04:10:59

COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
PFBA		1:53	40.0	39.2	98.0
PFPeA		4:22	20.0	19.5	97.6
PFHxA		4:57	10.0	9.54	95.4
PFHpA		5:24	10.0	9.61	96.1
PFOA		6:09	10.0	9.25	92.5
PFNA		7:00	10.0	9.78	97.8
PFDA		7:30	10.0	10.1	101
PFUnA		7:50	10.0	9.42	94.2
PFDoA		8:05	10.0	10.7	107
PFTrDA		8:25	10.0	10.0	100
PFTeDA		8:50	10.0	9.86	98.6
PFBS		4:54	10.0	9.75	97.5
PFPeS		5:26	10.0	10.7	107
PFHxS		6:16	10.0	9.89	98.9
PFHpS		7:07	10.0	9.88	98.8
PFOS		7:36	10.0	9.30	93.0
PFNS		7:55	10.0	10.2	102
PFDS		8:12	10.0	10.1	101
PFDoS		9:00	10.0	9.71	97.1
4:2 FTS		4:50	40.0	42.3	106
6:2 FTS		5:51	36.0	34.3	95.3
8:2 FTS		7:20	40.0	37.0	92.4
PFOSA		8:41	10.0	9.93	99.3
N-MeFOSA		10:07	11.5	12.0	104
N-EtFOSA		10:25	25.0	23.4	93.7
MeFOSAA		7:33	10.0	10.9	109
EtFOSAA		7:42	10.0	9.74	97.4
N-MeFOSE		10:00	100	99.9	99.9
N-EtFOSE		10:18	75.0	77.1	103
HFPO-DA		5:05	40.0	39.5	98.7
ADONA		5:38	40.0	39.5	98.6
9CI-PF3ONS		7:50	40.0	41.2	103
11CI-PF3OUdS		8:26	40.0	42.5	106

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

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 Report Filename: PFOA_FC_LC_FC0L_188S12__Form4A_SJ2752951.html; Workgroup: WG72539; Design ID: 3989]

SGS AXYS METHOD MLA-110 Rev 02

Form 4B
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES
 2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date:	18-Mar-2020	VER Data Filename:	FC0L_188 S: 12
Instrument ID:	LCMS/MS	Analysis Date:	11-Jun-2020
LC Column ID:	C18	Analysis Time:	04:10:59

LABELED COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
13C4-PFBA		1:53	40.0	39.2	98.1
13C5-PFPeA		4:22	20.0	21.9	110
13C5-PFHxA		4:57	10.0	10.5	105
13C4-PFHpA		5:24	10.0	10.6	106
13C8-PFOA		6:09	10.0	10.1	101
13C9-PFNA		7:00	5.00	4.80	96.0
13C6-PFDA		7:30	5.00	5.17	103
13C7-PFUnA		7:50	5.00	5.04	101
13C2-PFDaA		8:05	5.00	5.00	100
13C2-PFTeDA		8:49	5.00	4.65	93.0
13C3-PFBS		4:54	9.18	10.1	110
13C3-PFHxS		6:15	10.0	10.2	102
13C8-PFOS		7:36	10.0	10.6	106
13C2-4:2 FTS		4:50	20.0	16.1	80.7
13C2-6:2 FTS		5:51	20.0	17.5	87.4
13C2-8:2 FTS		7:20	20.0	19.7	98.6
13C8-PFOSA		8:41	10.0	9.85	98.5
D3-N-MeFOSA		10:07	10.0	10.6	106
D5-N-EtFOSA		10:24	10.0	10.7	107
D3-MeFOSAA		7:33	20.0	18.1	90.7
D5-EtFOSAA		7:41	20.0	18.5	92.7
d7-NMe-FOSE		9:59	100	104	104
d9-NEt-FOSE		10:17	100	106	106
13C3-HFPO-DA		5:05	40.0	40.5	101

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

For Axys Internal Use Only [XSL Template: FC-Form4B.xsl; Created: 19-Jun-2020 12:17:30; Application: XMLTransformer-1.18.8;
 Report Filename: PFOA_FC_LC_FC0L_188S12__Form4B_SJ2752951.html; Workgroup: WG72539; Design ID: 3989]

Accreditation Scope

SGS AXYS Analytical Services Ltd.
ref.: ACC-101 Rev. 49

Accreditation Scope

SGS AXYS Analytical Services Ltd.
ref.: ACC-101 Rev. 49

accreditation Scope		SGS AXYS Analytical Services Ltd.																
		e ref.: ACC-101 Rev. 49																
Compound	Class	Non-Polarable Water																
		CALA	Urine	Alaska DEC	ANAB DEC	ANAB ISO 17025	ANAB ISO 17025	ANAB ISO 17025	ANAB ISO 17025	ANAB ISO 17025	ANAB ISO 17025	ANAB ISO 17025	ANAB ISO 17025	ANAB ISO 17025	ANAB ISO 17025	ANAB ISO 17025	ANAB ISO 17025	
Alpha-HCH	H	EPA 1699	SGS AXYS MLA-028	MLA-A-028	SGS AXYS MLA-007	MLA-A-007	SGS AXYS MLA-228	MLA-A-228	SGS AXYS MLA-007	MLA-A-007	SGS AXYS MLA-007	MLA-A-007	SGS AXYS MLA-007	MLA-A-007	SGS AXYS MLA-007	MLA-A-007	SGS AXYS MLA-007	MLA-A-007
Beta-HCH	H	EPA 8270	SGS AXYS MLA-028	MLA-A-028	EPA 1699	SGS AXYS MLA-028	MLA-A-028	EPA 625	SGS AXYS MLA-228	MLA-A-228	EPA 8270	SGS AXYS MLA-028	MLA-A-028	EPA 1699	SGS AXYS MLA-028	MLA-A-028	EPA 8270	SGS AXYS MLA-028
Chordane, technical		EPA 8270	SGS AXYS MLA-007	MLA-A-007	SGS AXYS MLA-007	MLA-A-007	SGS AXYS MLA-007	MLA-A-007	SGS AXYS MLA-007	MLA-A-007	SGS AXYS MLA-007	MLA-A-007	SGS AXYS MLA-007	MLA-A-007	SGS AXYS MLA-007	MLA-A-007	SGS AXYS MLA-007	MLA-A-007
cis-Chlordane (alpha-Chlordane)		EPA 1699	SGS AXYS MLA-028	MLA-A-028	SGS AXYS MLA-007	MLA-A-007	SGS AXYS MLA-028	MLA-A-028	SGS AXYS MLA-007	MLA-A-007	SGS AXYS MLA-007	MLA-A-007	SGS AXYS MLA-007	MLA-A-007	SGS AXYS MLA-007	MLA-A-007	SGS AXYS MLA-007	MLA-A-007
cis-Nonachlor		EPA 8270	SGS AXYS MLA-228	MLA-A-228	EPA 1699	SGS AXYS MLA-028	MLA-A-028	EPA 8270	SGS AXYS MLA-007	MLA-A-007	EPA 8270	SGS AXYS MLA-028	MLA-A-028	EPA 1699	SGS AXYS MLA-028	MLA-A-028	EPA 8270	SGS AXYS MLA-028
Delta-HCH	H	EPA 8081	SGS AXYS MLA-007	MLA-A-007	EPA 1699	SGS AXYS MLA-028	MLA-A-028	EPA 8081	SGS AXYS MLA-007	MLA-A-007	EPA 8081	SGS AXYS MLA-028	MLA-A-028	EPA 1699	SGS AXYS MLA-028	MLA-A-028	EPA 8081	SGS AXYS MLA-028
Diekdrin		EPA 8081	SGS AXYS MLA-007	MLA-A-007	EPA 1699	SGS AXYS MLA-028	MLA-A-028	EPA 8081	SGS AXYS MLA-007	MLA-A-007	EPA 8081	SGS AXYS MLA-028	MLA-A-028	EPA 1699	SGS AXYS MLA-028	MLA-A-028	EPA 8081	SGS AXYS MLA-028
Endosulfophan I		EPA 8081	SGS AXYS MLA-007	MLA-A-007	EPA 1699	SGS AXYS MLA-028	MLA-A-028	EPA 8081	SGS AXYS MLA-007	MLA-A-007	EPA 8081	SGS AXYS MLA-028	MLA-A-028	EPA 1699	SGS AXYS MLA-028	MLA-A-028	EPA 8081	SGS AXYS MLA-028
Endosulfophan II		EPA 8081	SGS AXYS MLA-007	MLA-A-007	EPA 1699	SGS AXYS MLA-028	MLA-A-028	EPA 8081	SGS AXYS MLA-007	MLA-A-007	EPA 8081	SGS AXYS MLA-028	MLA-A-028	EPA 1699	SGS AXYS MLA-028	MLA-A-028	EPA 8081	SGS AXYS MLA-028
Endosulfophan sulphate		EPA 8081	SGS AXYS MLA-007	MLA-A-007	EPA 1699	SGS AXYS MLA-028	MLA-A-028	EPA 8081	SGS AXYS MLA-007	MLA-A-007	EPA 8081	SGS AXYS MLA-028	MLA-A-028	EPA 1699	SGS AXYS MLA-028	MLA-A-028	EPA 8081	SGS AXYS MLA-028
Endrin		EPA 8081	SGS AXYS MLA-007	MLA-A-007	EPA 1699	SGS AXYS MLA-028	MLA-A-028	EPA 8081	SGS AXYS MLA-007	MLA-A-007	EPA 8081	SGS AXYS MLA-028	MLA-A-028	EPA 1699	SGS AXYS MLA-028	MLA-A-028	EPA 8081	SGS AXYS MLA-028

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ID	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30	Q31	Q32	Q33	Q34	Q35	Q36	Q37	Q38	Q39	Q40	Q41	Q42	Q43	Q44	Q45	Q46	Q47	Q48	Q49	Q50	Q51	Q52	Q53	Q54	Q55	Q56	Q57	Q58	Q59	Q60	Q61	Q62	Q63	Q64	Q65	Q66	Q67	Q68	Q69	Q70	Q71	Q72	Q73	Q74	Q75	Q76	Q77	Q78	Q79	Q80	Q81	Q82	Q83	Q84	Q85	Q86	Q87	Q88	Q89	Q90	Q91	Q92	Q93	Q94	Q95	Q96	Q97	Q98	Q99	Q100	Q101	Q102	Q103	Q104	Q105	Q106	Q107	Q108	Q109	Q110	Q111	Q112	Q113	Q114	Q115	Q116	Q117	Q118	Q119	Q120	Q121	Q122	Q123	Q124	Q125	Q126	Q127	Q128	Q129	Q130	Q131	Q132	Q133	Q134	Q135	Q136	Q137	Q138	Q139	Q140	Q141	Q142	Q143	Q144	Q145	Q146	Q147	Q148	Q149	Q150	Q151	Q152	Q153	Q154	Q155	Q156	Q157	Q158	Q159	Q160	Q161	Q162	Q163	Q164	Q165	Q166	Q167	Q168	Q169	Q170	Q171	Q172	Q173	Q174	Q175	Q176	Q177	Q178	Q179	Q180	Q181	Q182	Q183	Q184	Q185	Q186	Q187	Q188	Q189	Q190	Q191	Q192	Q193	Q194	Q195	Q196	Q197	Q198	Q199	Q200	Q201	Q202	Q203	Q204	Q205	Q206	Q207	Q208	Q209	Q210	Q211	Q212	Q213	Q214	Q215	Q216	Q217	Q218	Q219	Q220	Q221	Q222	Q223	Q224	Q225	Q226	Q227	Q228	Q229	Q230	Q231	Q232	Q233	Q234	Q235	Q236	Q237	Q238	Q239	Q240	Q241	Q242	Q243	Q244	Q245	Q246	Q247	Q248	Q249	Q250	Q251	Q252	Q253	Q254	Q255	Q256	Q257	Q258	Q259	Q260	Q261	Q262	Q263	Q264	Q265	Q266	Q267	Q268	Q269	Q270	Q271	Q272	Q273	Q274	Q275	Q276	Q277	Q278	Q279	Q280	Q281	Q282	Q283	Q284	Q285	Q286	Q287	Q288	Q289	Q290	Q291	Q292	Q293	Q294	Q295	Q296	Q297	Q298	Q299	Q300	Q301	Q302	Q303	Q304	Q305	Q306	Q307	Q308	Q309	Q310	Q311	Q312	Q313	Q314	Q315	Q316	Q317	Q318	Q319	Q320	Q321	Q322	Q323	Q324	Q325	Q326	Q327	Q328	Q329	Q330	Q331	Q332	Q333	Q334	Q335	Q336	Q337	Q338	Q339	Q340	Q341	Q342	Q343	Q344	Q345	Q346	Q347	Q348	Q349	Q350	Q351	Q352	Q353	Q354	Q355	Q356	Q357	Q358	Q359	Q360	Q361	Q362	Q363	Q364	Q365	Q366	Q367	Q368	Q369	Q370	Q371	Q372	Q373	Q374	Q375	Q376	Q377	Q378	Q379	Q380	Q381	Q382	Q383	Q384	Q385	Q386	Q387	Q388	Q389	Q390	Q391	Q392	Q393	Q394	Q395	Q396	Q397	Q398	Q399	Q400	Q401	Q402	Q403	Q404	Q405	Q406	Q407	Q408	Q409	Q410	Q411	Q412	Q413	Q414	Q415	Q416	Q417	Q418	Q419	Q420	Q421	Q422	Q423	Q424	Q425	Q426	Q427	Q428	Q429	Q430	Q431	Q432	Q433	Q434	Q435	Q436	Q437	Q438	Q439	Q440	Q441	Q442	Q443	Q444	Q445	Q446	Q447	Q448	Q449	Q450	Q451	Q452	Q453	Q454	Q455	Q456	Q457	Q458	Q459	Q460	Q461	Q462	Q463	Q464	Q465	Q466	Q467	Q468	Q469	Q470	Q471	Q472	Q473	Q474	Q475	Q476	Q477	Q478	Q479	Q480	Q481	Q482	Q483	Q484	Q485	Q486	Q487	Q488	Q489	Q490	Q491	Q492	Q493	Q494	Q495	Q496	Q497	Q498	Q499	Q500	Q501	Q502	Q503	Q504	Q505	Q506	Q507	Q508	Q509	Q510	Q511	Q512	Q513	Q514	Q515	Q516	Q517	Q518	Q519	Q520	Q521	Q522	Q523	Q524	Q525	Q526	Q527	Q528	Q529	Q530	Q531	Q532	Q533	Q534	Q535	Q536	Q537	Q538	Q539	Q540	Q541	Q542	Q543	Q544	Q545	Q546	Q547	Q548	Q549	Q550	Q551	Q552	Q553	Q554	Q555	Q556	Q557	Q558	Q559	Q550	Q551	Q552	Q553	Q554	Q555	Q556	Q557	Q558	Q559	Q560	Q561	Q562	Q563	Q564	Q565	Q566	Q567	Q568	Q569	Q560	Q561	Q562	Q563	Q564	Q565	Q566	Q567	Q568	Q569	Q570	Q571	Q572	Q573	Q574	Q575	Q576	Q577	Q578	Q579	Q570	Q571	Q572	Q573	Q574	Q575	Q576	Q577	Q578	Q579	Q580	Q581	Q582	Q583	Q584	Q585	Q586	Q587	Q588	Q589	Q580	Q581	Q582	Q583	Q584	Q585	Q586	Q587	Q588	Q589	Q590	Q591	Q592	Q593	Q594	Q595	Q596	Q597	Q598	Q599	Q590	Q591	Q592	Q593	Q594	Q595	Q596	Q597	Q598	Q599	Q600	Q601	Q602	Q603	Q604	Q605	Q606	Q607	Q608	Q609	Q600	Q601	Q602	Q603	Q604	Q605	Q606	Q607	Q608	Q609	Q610	Q611	Q612	Q613	Q614	Q615	Q616	Q617	Q618	Q619	Q610	Q611	Q612	Q613	Q614	Q615	Q616	Q617	Q618	Q619	Q620	Q621	Q622	Q623	Q624	Q625	Q626	Q627	Q628	Q629	Q620	Q621	Q622	Q623	Q624	Q625	Q626	Q627	Q628	Q629	Q630	Q631	Q632	Q633	Q634	Q635	Q636	Q637	Q638	Q639	Q630	Q631	Q632	Q633	Q634	Q635	Q636	Q637	Q638	Q639	Q640	Q641	Q642	Q643	Q644	Q645	Q646	Q647	Q648	Q649	Q640	Q641	Q642	Q643	Q644	Q645	Q646	Q647	Q648	Q649	Q650	Q651	Q652	Q653	Q654	Q655	Q656	Q657	Q658	Q659	Q650	Q651	Q652	Q653	Q654	Q655	Q656	Q657	Q658	Q659	Q660	Q661	Q662	Q663	Q664	Q665	Q666	Q667	Q668	Q669	Q660	Q661	Q662	Q663	Q664	Q665	Q666	Q667	Q668	Q669	Q670	Q671	Q672	Q673	Q674	Q675	Q676	Q677	Q678	Q679	Q670	Q671	Q672	Q673	Q674	Q675	Q676	Q677	Q678	Q679	Q680	Q681	Q682	Q683	Q684	Q685	Q686	Q687	Q688	Q689	Q680	Q681	Q682	Q683	Q684	Q685	Q686	Q687	Q688	Q689	Q690	Q691	Q692	Q693	Q694	Q695	Q696	Q697	Q698	Q699	Q690	Q691	Q692	Q693	Q694	Q695	Q696	Q697	Q698	Q699	Q700	Q701	Q702	Q703	Q704	Q705	Q706	Q707	Q708	Q709	Q700	Q701	Q702	Q703	Q704	Q705	Q706	Q707	Q708	Q709	Q710	Q711	Q712	Q713	Q714	Q715	Q716	Q717	Q718	Q719	Q710	Q711	Q712	Q713	Q714	Q715	Q716	Q717	Q718	Q719	Q720	Q721	Q722	Q723	Q724	Q725	Q726	Q727	Q728	Q729	Q720	Q721	Q722	Q723	Q724	Q725	Q726	Q727	Q728	Q729	Q730	Q731	Q732	Q733	Q734	Q735	Q736	Q737	Q738	Q739	Q730	Q731	Q732	Q733	Q734	Q735	Q736	Q737	Q738	Q739	Q740	Q741	Q742	Q743	Q744	Q745	Q746	Q747	Q748	Q749	Q740	Q741	Q742	Q743	Q744	Q745	Q746	Q747	Q748	Q749	Q750	Q751	Q752	Q753	Q754	Q755	Q756	Q757	Q758	Q759	Q750	Q751	Q752	Q753	Q754	Q755	Q756	Q757	Q758	Q759	Q760	Q761	Q762	Q763	Q764	Q765	Q766	Q767	Q768	Q769	Q760	Q761	Q762	Q763	Q764	Q765	Q766	Q767	Q768	Q769	Q770	Q771	Q772	Q773	Q774	Q775	Q776	Q777	Q778	Q779	Q770	Q771	Q772	Q773	Q774	Q775	Q776	Q777	Q778	Q779	Q780	Q781	Q782	Q783	Q784	Q785	Q786	Q787	Q788	Q789	Q780	Q781	Q782	Q783	Q784	Q785	Q786	Q787	Q788	Q789	Q790	Q791	Q792	Q793	Q794	Q795	Q796	Q797	Q798	Q799	Q790	Q791	Q792	Q793	Q794	Q795	Q796	Q797	Q798	Q799	Q800	Q801	Q802	Q803	Q804	Q805	Q806	Q807	Q808	Q809	Q800	Q801	Q802	Q803	Q804	Q805	Q806	Q807	Q808	Q809	Q810	Q811	Q812	Q813	Q814	Q815	Q816	Q817	Q818	Q819	Q810	Q811	Q812	Q813	Q814	Q815	Q816	Q817	Q818	Q819	Q820	Q821	Q822	Q823	Q824	Q825	Q826	Q827	Q828	Q829	Q820	Q821	Q822	Q823	Q824	Q825	Q826	Q827	Q828	Q829	Q830	Q831	Q832	Q833	Q834	Q835	Q836	Q837	Q838	Q839	Q830	Q831	Q832	Q833	Q834	Q835	Q836	Q837	Q838	Q839	Q840	Q841	Q842	Q843	Q844	Q845	Q846	Q847	Q848	Q849	Q840	Q841	Q842	Q843	Q844	Q845	Q846	Q847	Q848	Q849	Q850	Q851	Q852	Q853	Q854	Q855	Q856	Q857	Q858	Q859	Q850	Q851	Q852	Q853	Q854	Q855	Q856	Q857	Q858	Q859	Q860	Q861	Q862	Q863	Q864	Q865	Q866	Q867	Q868	Q869	Q860	Q861	Q862	Q863	Q864	Q865	Q866	Q867	Q868	Q869	Q870	Q871	Q872	Q873	Q874	Q875	Q876	Q877	Q878	Q879	Q870	Q871	Q872	Q873	Q874	Q875	Q876	Q877	Q878	Q879	Q880	Q881	Q882	Q883	Q884	Q885	Q886	Q887	Q888	Q889	Q880	Q881	Q882	Q883	Q884	Q885	Q886	Q887	Q888	Q889	Q890	Q891	Q892	Q893	Q894	Q895	Q896	Q897	Q898	Q899	Q890	Q891	Q892	Q893	Q894	Q895	Q896	Q897	Q898	Q899	Q900	Q901	Q902	Q903	Q904	Q905	Q906	Q907

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30	Q31	Q32	Q33	Q34	Q35	Q36	Q37	Q38	Q39	Q40	Q41	Q42	Q43	Q44	Q45	Q46	Q47	Q48	Q49	Q50	Q51	Q52	Q53	Q54	Q55	Q56	Q57	Q58	Q59	Q60	Q61	Q62	Q63	Q64	Q65	Q66	Q67	Q68	Q69	Q70	Q71	Q72	Q73	Q74	Q75	Q76	Q77	Q78	Q79	Q80	Q81	Q82	Q83	Q84	Q85	Q86	Q87	Q88	Q89	Q90	Q91	Q92	Q93	Q94	Q95	Q96	Q97	Q98	Q99	Q100	Q101	Q102	Q103	Q104	Q105	Q106	Q107	Q108	Q109	Q110	Q111	Q112	Q113	Q114	Q115	Q116	Q117	Q118	Q119	Q120	Q121	Q122	Q123	Q124	Q125	Q126	Q127	Q128	Q129	Q130	Q131	Q132	Q133	Q134	Q135	Q136	Q137	Q138	Q139	Q140	Q141	Q142	Q143	Q144	Q145	Q146	Q147	Q148	Q149	Q150	Q151	Q152	Q153	Q154	Q155	Q156	Q157	Q158	Q159	Q160	Q161	Q162	Q163	Q164	Q165	Q166	Q167	Q168	Q169	Q170	Q171	Q172	Q173	Q174	Q175	Q176	Q177	Q178	Q179	Q180	Q181	Q182	Q183	Q184	Q185	Q186	Q187	Q188	Q189	Q190	Q191	Q192	Q193	Q194	Q195	Q196	Q197	Q198	Q199	Q200	Q201	Q202	Q203	Q204	Q205	Q206	Q207	Q208	Q209	Q210	Q211	Q212	Q213	Q214	Q215	Q216	Q217	Q218	Q219	Q220	Q221	Q222	Q223	Q224	Q225	Q226	Q227	Q228	Q229	Q230	Q231	Q232	Q233	Q234	Q235	Q236	Q237	Q238	Q239	Q240	Q241	Q242	Q243	Q244	Q245	Q246	Q247	Q248	Q249	Q250	Q251	Q252	Q253	Q254	Q255	Q256	Q257	Q258	Q259	Q260	Q261	Q262	Q263	Q264	Q265	Q266	Q267	Q268	Q269	Q270	Q271	Q272	Q273	Q274	Q275	Q276	Q277	Q278	Q279	Q280	Q281	Q282	Q283	Q284	Q285	Q286	Q287	Q288	Q289	Q290	Q291	Q292	Q293	Q294	Q295	Q296	Q297	Q298	Q299	Q300	Q301	Q302	Q303	Q304	Q305	Q306	Q307	Q308	Q309	Q310	Q311	Q312	Q313	Q314	Q315	Q316	Q317	Q318	Q319	Q320	Q321	Q322	Q323	Q324	Q325	Q326	Q327	Q328	Q329	Q330	Q331	Q332	Q333	Q334	Q335	Q336	Q337	Q338	Q339	Q340	Q341	Q342	Q343	Q344	Q345	Q346	Q347	Q348	Q349	Q350	Q351	Q352	Q353	Q354	Q355	Q356	Q357	Q358	Q359	Q360	Q361	Q362	Q363	Q364	Q365	Q366	Q367	Q368	Q369	Q370	Q371	Q372	Q373	Q374	Q375	Q376	Q377	Q378	Q379	Q380	Q381	Q382	Q383	Q384	Q385	Q386	Q387	Q388	Q389	Q390	Q391	Q392	Q393	Q394	Q395	Q396	Q397	Q398	Q399	Q400	Q401	Q402	Q403	Q404	Q405	Q406	Q407	Q408	Q409	Q410	Q411	Q412	Q413	Q414	Q415	Q416	Q417	Q418	Q419	Q420	Q421	Q422	Q423	Q424	Q425	Q426	Q427	Q428	Q429	Q430	Q431	Q432	Q433	Q434	Q435	Q436	Q437	Q438	Q439	Q440	Q441	Q442	Q443	Q444	Q445	Q446	Q447	Q448	Q449	Q450	Q451	Q452	Q453	Q454	Q455	Q456	Q457	Q458	Q459	Q460	Q461	Q462	Q463	Q464	Q465	Q466	Q467	Q468	Q469	Q470	Q471	Q472	Q473	Q474	Q475	Q476	Q477	Q478	Q479	Q480	Q481	Q482	Q483	Q484	Q485	Q486	Q487	Q488	Q489	Q490	Q491	Q492	Q493	Q494	Q495	Q496	Q497	Q498	Q499	Q500	Q501	Q502	Q503	Q504	Q505	Q506	Q507	Q508	Q509	Q510	Q511	Q512	Q513	Q514	Q515	Q516	Q517	Q518	Q519	Q520	Q521	Q522	Q523	Q524	Q525	Q526	Q527	Q528	Q529	Q530	Q531	Q532	Q533	Q534	Q535	Q536	Q537	Q538	Q539	Q540	Q541	Q542	Q543	Q544	Q545	Q546	Q547	Q548	Q549	Q550	Q551	Q552	Q553	Q554	Q555	Q556	Q557	Q558	Q559	Q550	Q551	Q552	Q553	Q554	Q555	Q556	Q557	Q558	Q559	Q560	Q561	Q562	Q563	Q564	Q565	Q566	Q567	Q568	Q569	Q560	Q561	Q562	Q563	Q564	Q565	Q566	Q567	Q568	Q569	Q570	Q571	Q572	Q573	Q574	Q575	Q576	Q577	Q578	Q579	Q570	Q571	Q572	Q573	Q574	Q575	Q576	Q577	Q578	Q579	Q580	Q581	Q582	Q583	Q584	Q585	Q586	Q587	Q588	Q589	Q580	Q581	Q582	Q583	Q584	Q585	Q586	Q587	Q588	Q589	Q590	Q591	Q592	Q593	Q594	Q595	Q596	Q597	Q598	Q599	Q590	Q591	Q592	Q593	Q594	Q595	Q596	Q597	Q598	Q599	Q600	Q601	Q602	Q603	Q604	Q605	Q606	Q607	Q608	Q609	Q600	Q601	Q602	Q603	Q604	Q605	Q606	Q607	Q608	Q609	Q610	Q611	Q612	Q613	Q614	Q615	Q616	Q617	Q618	Q619	Q610	Q611	Q612	Q613	Q614	Q615	Q616	Q617	Q618	Q619	Q620	Q621	Q622	Q623	Q624	Q625	Q626	Q627	Q628	Q629	Q620	Q621	Q622	Q623	Q624	Q625	Q626	Q627	Q628	Q629	Q630	Q631	Q632	Q633	Q634	Q635	Q636	Q637	Q638	Q639	Q630	Q631	Q632	Q633	Q634	Q635	Q636	Q637	Q638	Q639	Q640	Q641	Q642	Q643	Q644	Q645	Q646	Q647	Q648	Q649	Q640	Q641	Q642	Q643	Q644	Q645	Q646	Q647	Q648	Q649	Q650	Q651	Q652	Q653	Q654	Q655	Q656	Q657	Q658	Q659	Q650	Q651	Q652	Q653	Q654	Q655	Q656	Q657	Q658	Q659	Q660	Q661	Q662	Q663	Q664	Q665	Q666	Q667	Q668	Q669	Q660	Q661	Q662	Q663	Q664	Q665	Q666	Q667	Q668	Q669	Q670	Q671	Q672	Q673	Q674	Q675	Q676	Q677	Q678	Q679	Q670	Q671	Q672	Q673	Q674	Q675	Q676	Q677	Q678	Q679	Q680	Q681	Q682	Q683	Q684	Q685	Q686	Q687	Q688	Q689	Q680	Q681	Q682	Q683	Q684	Q685	Q686	Q687	Q688	Q689	Q690	Q691	Q692	Q693	Q694	Q695	Q696	Q697	Q698	Q699	Q690	Q691	Q692	Q693	Q694	Q695	Q696	Q697	Q698	Q699	Q700	Q701	Q702	Q703	Q704	Q705	Q706	Q707	Q708	Q709	Q700	Q701	Q702	Q703	Q704	Q705	Q706	Q707	Q708	Q709	Q710	Q711	Q712	Q713	Q714	Q715	Q716	Q717	Q718	Q719	Q710	Q711	Q712	Q713	Q714	Q715	Q716	Q717	Q718	Q719	Q720	Q721	Q722	Q723	Q724	Q725	Q726	Q727	Q728	Q729	Q720	Q721	Q722	Q723	Q724	Q725	Q726	Q727	Q728	Q729	Q730	Q731	Q732	Q733	Q734	Q735	Q736	Q737	Q738	Q739	Q730	Q731	Q732	Q733	Q734	Q735	Q736	Q737	Q738	Q739	Q740	Q741	Q742	Q743	Q744	Q745	Q746	Q747	Q748	Q749	Q740	Q741	Q742	Q743	Q744	Q745	Q746	Q747	Q748	Q749	Q750	Q751	Q752	Q753	Q754	Q755	Q756	Q757	Q758	Q759	Q750	Q751	Q752	Q753	Q754	Q755	Q756	Q757	Q758	Q759	Q760	Q761	Q762	Q763	Q764	Q765	Q766	Q767	Q768	Q769	Q760	Q761	Q762	Q763	Q764	Q765	Q766	Q767	Q768	Q769	Q770	Q771	Q772	Q773	Q774	Q775	Q776	Q777	Q778	Q779	Q770	Q771	Q772	Q773	Q774	Q775	Q776	Q777	Q778	Q779	Q780	Q781	Q782	Q783	Q784	Q785	Q786	Q787	Q788	Q789	Q780	Q781	Q782	Q783	Q784	Q785	Q786	Q787	Q788	Q789	Q790	Q791	Q792	Q793	Q794	Q795	Q796	Q797	Q798	Q799	Q790	Q791	Q792	Q793	Q794	Q795	Q796	Q797	Q798	Q799	Q800	Q801	Q802	Q803	Q804	Q805	Q806	Q807	Q808	Q809	Q800	Q801	Q802	Q803	Q804	Q805	Q806	Q807	Q808	Q809	Q810	Q811	Q812	Q813	Q814	Q815	Q816	Q817	Q818	Q819	Q810	Q811	Q812	Q813	Q814	Q815	Q816	Q817	Q818	Q819	Q820	Q821	Q822	Q823	Q824	Q825	Q826	Q827	Q828	Q829	Q820	Q821	Q822	Q823	Q824	Q825	Q826	Q827	Q828	Q829	Q830	Q831	Q832	Q833	Q834	Q835	Q836	Q837	Q838	Q839	Q830	Q831	Q832	Q833	Q834	Q835	Q836	Q837	Q838	Q839	Q840	Q841	Q842	Q843	Q844	Q845	Q846	Q847	Q848	Q849	Q840	Q841	Q842	Q843	Q844	Q845	Q846	Q847	Q848	Q849	Q850	Q851	Q852	Q853	Q854	Q855	Q856	Q857	Q858	Q859	Q850	Q851	Q852	Q853	Q854	Q855	Q856	Q857	Q858	Q859	Q860	Q861	Q862	Q863	Q864	Q865	Q866	Q867	Q868	Q869	Q860	Q861	Q862	Q863	Q864	Q865	Q866	Q867	Q868	Q869	Q870	Q871	Q872	Q873	Q874	Q875	Q876	Q877	Q878	Q879	Q870	Q871	Q872	Q873	Q874	Q875	Q876	Q877	Q878	Q879	Q880	Q881	Q882	Q883	Q884	Q885	Q886	Q887	Q888	Q889	Q880	Q881	Q882	Q883	Q884	Q885	Q886	Q887	Q888	Q889	Q890	Q891	Q892	Q893	Q894	Q895	Q896	Q897	Q898	Q899	Q890	Q891	Q892	Q893	Q894	Q895	Q896	Q897	Q898	Q899	Q900	Q901	Q902	Q903	Q904	Q905	Q906	Q907	Q908	Q909

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		Ref.: ACC-101 Rev. 49																	
Compound Class	Compound	Water, Non-Potable								Water									
		California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DEG	Washington DE	West Virginia DE	Wisconsin DEP	Alaska DEC	ANAB DOD ..	ANAB ISO 17025	Tissue	Water		
1,2,3,4,7-Et-HxCDF	SGS AXYS MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	ANAB DOD ..	ANAB ISO 17025		
1,2,3,6,7-Et-HxCDD	EPA 1613	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	ANAB DOD ..	ANAB ISO 17025	
1,2,3,7,8-Et-HxCDD	EPA 8290	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	ANAB DOD ..	ANAB ISO 17025
1,2,3,6,7,8-HxCDD	EPA 1613	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	ANAB DOD ..	ANAB ISO 17025
1,2,3,7,8,9-HxCDD	EPA 8290	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	ANAB DOD ..	ANAB ISO 17025
1,2,3,7,8,9-PeCDD	EPA 1613	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	OCDD	SGS
2,3,4,6,7-Et-HxCDF	EPA 8290	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	2,3,4,6,7-Et-HxCDF	SGS
2,3,4,7,8-PeCDD	EPA 1613	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	2,3,4,7,8-PeCDD	SGS
2,3,7,8-TCDD	EPA 8290	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	2,3,7,8-TCDD	SGS
OCDD	EPA 1613	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	Total HxCDD	SGS
OCDF	EPA 1613	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	Total HxCDF	SGS
Total HxCDD	EPA 1613	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	MLA-017	Total HxCDF	SGS

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Aqueous film forming foam
BFR
BPA and mPE
OC Pesticides
PAH
PBDE
PCB
PCDF
PFAS
PPCP
TOP
California WB
Florida DOH
Pennsylvania DEP
Minnesota DOH
New Jersey DEP
New York DOH
Washington DE
Virginia OGS
Alaska DEC
Maine DOH

Brominated flame retardants (non-PBDE/PPE)
Bisphenol A and mono-Phthalate Esters
Organochlorine Pesticides
Polycyclic Aromatic Hydrocarbons
Polybrominated Diphenyl ethers
Polychlorinated Biphenyls
Polychlorinated dibenzofurans/furans
Per- and Polyfluoralkyl Substances
Pharmaceutical and Personal Care Products
Total Oxidizable Precursors
California Water Boards, Lab D 2911
Florida Department of Health, Lab ID 2817007, (NELAC Standard)
Pennsylvania Department of Environmental Protection
Minnesota Department of Health, Lab ID 232-989-420, (NELAC Standard)
New Jersey Department of Environmental Protection, Lab ID CANA005, (NELAC Standard)
New York Department of Health, Lab ID 1674, (NELAC Standard)
Washington Department of Ecology, Lab ID C404
Virginia General Services, Division of Consolidated Laboratory Services, Lab ID 660224, (NELAC Standard)
Alaska Department of Environmental Conservation, Contaminated Sites Laboratory Approval 17-014
Maine Center for Disease Control and Prevention, Department of Health and Human Services, Lab ID CN00003



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DOD ELAP
Certificate ADE-1861